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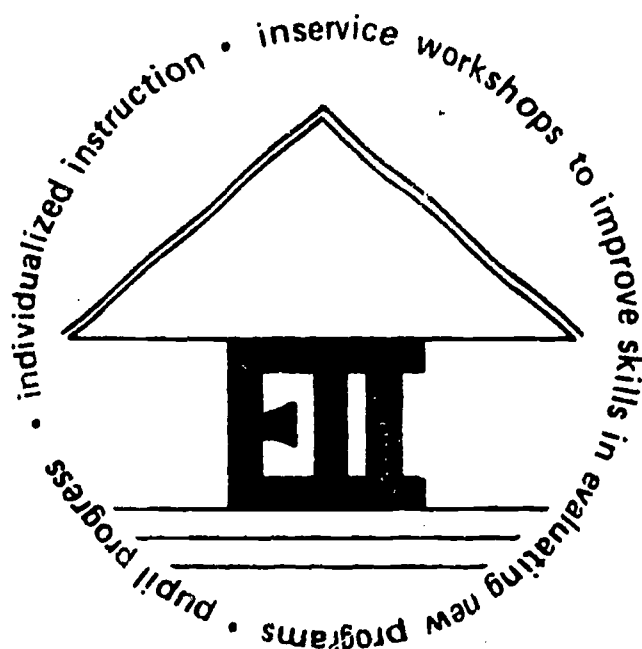   Instruction Project

ABSTRACT
                The Objective-Item Bank presented covers 16 sections
of four subject areas in each of four grade levels. The four areas
are: Language Arts, Math, Social Studies, and Science. The four grade
levels are: Primary, Intermediate, Junior High, and High School. The
Objective-Item Bank provides school administrators with an initial
starting point for curriculum development and with the
instrumentation for program evaluation, and offers a mechanism to
assist teachers in stating more specifically the goals of their
instructional program. In addition, it provides the means to
determine the extent to which the objectives are accomplished. This
document presents the Objective Item Bank for primary mathematics.
(CK)

PRIMARY MATHEMATICS
BEHAVIORAL OBJECTIVES AND TEST ITEMS

EVALUATION FOR INDIVIDUALIZED INSTRUCTION

A Title III ESEA project
administered by
Downers Grove, Illinois
School District 99

individualized instruction • inservice workshops to improve skills in evaluating new programs • public progress

1400 West Maple Avenue
Downers Grove, Illinois 60515
Phone: 312-971-2040

	Lang. Arts	Math.	Soc. Stud.	Science
Primary		X		
Intermediate				
Junior High				
High School				

PRIMARY MATHEMATICS

BEHAVIORAL OBJECTIVES AND TEST ITEMS

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Evaluation for Individualized Instruction Project

AN ESEA TITLE III PROJECT

Administered

by

Downers Grove Public School District 99

BEHAVIORAL OBJECTIVE - TEST ITEM BANK

BACKGROUND

The Evaluation for Individualized Instruction Project, an ESEA Title III project administered by the Downers Grove, Illinois, School District 99, has developed an Objective-Item Bank covering sixteen sectors of four subject areas in each of four grade levels.

Subject Area

	LA	MA	SS	SC
1	11	12	13	14
2	21	22	23	24
3	31	32	33	34
4	41	42	43	44

LA = Language Arts   1 = Primary
MA = Math   2 = Intermediate
SS = Social Studies   3 = Junior High
SC = Science   4 = High School

Nearly 5000 behavioral objectives and over 27,000 test items based on these objectives were recently published as the culmination of this three-year project. The complete output of seventeen volumes totals over 4500 pages. These publications have been reproduced by the Institute for Educational Research to make them available at cost to teachers and administrators.

The objectives and items were written by over 300 elementary and secondary teachers, representing forty Chicago suburban school districts, who participated in workshops of three to nine weeks duration throughout the project. In these workshops they learned to write effective behavioral objectives and test items based on the objectives. The results of their work were edited for content and measurement quality to compile the largest pool of objectives and test items ever assembled.

PRINCIPLES AND MERITS

Unfortunately, the Objective-Item Bank is often viewed mainly as a source of test items. Although this is an important function, its greatest potential impact lies not in the availability of a multitude of test items, but rather in the ability of these items to measure carefully selected educational goals.

The almost frenetic search for test items on the part of some educators has been spurred by the current emphasis on measurement. Some educators have become so enamored with measurement that they seem more interested in obtaining a numerical index than examining what they are really trying to measure. Further, it is

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not unusual for teachers to speak about a child obtaining a score of 95% on a particular test. Frequently, they encounter considerable difficulty in interpreting the real meaning of a score and are content to just accept its numeral value. A much more important question would seem to be: What are our goals of measurement? Unless we can answer this question precisely, the only real purpose that testing serves is to gather data concerning pupils to facilitate the marking of report cards. This is not to say that this function is not legitimate - it is rather to say that such a view of measurement is much too constricting. The goal of measurement should be to provide feedback both to the teacher and the child regarding the success or failure of the learning experiences in realizing specifically stated objectives.

One of the main strengths of the EII Objective and Item Bank is that all the items are directly tied to specifically stated objectives. Each group of items is designed to measure a specific objective and therefore provides the means whereby the teacher can obtain feedback on the success of the educational program.

It is disheartening to observe so many districts attacking the complex problem of curriculum development independently. One cannot help reflecting on the mammoth duplication of efforts involved. The Objective-Item Bank offers a possible alternative to this duplication. Utilizing its resources, the curriculum committee is provided with some point of departure. The efforts of three hundred teachers participating in the Evaluation Project's workshops and the thoughts of forty districts can be evaluated and utilized. This is not to suggest that any set of objectives should be viewed as the "answer" to an individual district's curricular problem but rather the efforts of others offer a convenient point of departure and may serve to stimulate diverse opinions about the direction of curricular thrust within the individual district. The words of Sir Isaac Newton seem appropriate; "If I have seen further, it is by standing upon the shoulder of giants." The efforts of others, whether we consider them giant-like or pygmyish do offer a threshold to view the immense, complicated problem of curricular development in better perspective.

The title of an article in a recent educational journal, "If You're Not Sure Where You're Going, You're Liable to End up Someplace Else," succinctly describes a continuing dilemma in our educational system. The vagueness of our goals often promotes the idea that "anything goes." Without a guiding beacon many classrooms become activity-centered rather than goal-oriented. One educator recently compared the all-too-typical classroom with Henry Ford's observation concerning history. He defined history as, "One damned thing after another." Is this true of the succession of activities within our classrooms? Does the teacher really know the educational purpose of each activity? Perhaps, even more importantly, do the children know the purpose?

The Objective-Item Bank offers a mechanism to assist teachers in stating more specifically the goals of their instructional program and further provides the means to determine the extent to which the objectives are accomplished. The specification of goals assists the teacher in discovering whether favored activities advance learning, or are merely time fillers; whether they get the "materials" across, or are merely perfunctory exercises.

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Much discussion has been devoted to the topic of "why individualized instruction?"
and occasionally some dialogue has even centered on the "how." But an even more
basic question is one that is often ignored: "Individualize what?"

Many school districts mention their individualized programs in reading or mathe-
matics. What is individualized within these programs? Are certain skills defi-
nitely identified? Is the practice of pretesting to determine the child's level
of proficiency when he enters the program a guideline?

The Objective-Item Bank has two potential contributions to make to all school dis-
tricts embarking on or presently engaged in individualized instruction programs.
These contributions are: 1. A group of well-specified objectives which could
form the "what" of the program. 2. A set of items designed to provide informa-
tion on the degree of mastery of the objective.

APPLICATIONS AND TECHNIQUES

The versatility of the Objective-Item Bank is evident in the value and usability
by both teachers and administrators.

To the Administration the Objective-Item Bank:

1. Provides an initial starting point for curriculum development. The
   existence of many objectives avoids the necessity of each district
   duplicating the efforts of another. The task of the curriculum com-
   mittee becomes one of selecting and/or rejecting objectives from the
   Objective - Item Bank and then supplementing them with objectives
   developed at the local level. Past-participants of the Evaluation
   Project workshops would be valuable resource people in this endeavor.

2. Provides the instrumentation for program evaluation. The selection
   of items from those objectives representative of the main emphases of
   the local district provides the framework for the evaluation of the
   stated goals.

To the Teacher the Objective-Item Bank:

1. Provides the pooling of talent and imagination of teachers of varied
   experience and interests, thus avoiding the present duplication of
   effort.

2. Provides resources for more highly sensitized program evaluation
   instead of a battery of standardized tests. Since the objectives
   are tailored to the program, the associated test items can be used
   to determine precisely the efficacy of the instructional materials.

3. Provides the means whereby the teacher can become more acutely aware
   of that which he is seeking to have occur in his classroom and that
   which he will accept as evidence of its occurrence. Hopefully, as
   teachers become more aware of their goals, they will share these

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objectives with children and let the pupils become acutely aware of that which is expected of them, ergo allowing them to seek their own modality of instruction for the realization of the stated goals.

4. Provides the nucleus of an individualized instruction program.

   a. It provides for more precise curriculum planning by differentiating those goals specific to each grade and even to each student. With the bank at their disposal, teachers are encouraged to become aware of their responsibilities in developing a set of basic objectives which every child must attain and a further set which can be pursued according to the students' abilities and interests.

   b. It provides several items per objective, some of which may be used as a pre-test to discover whether a student should undertake that objective while the remainder may be employed to measure the mastery of those students who do tackle the objective.

NOTES

Several of the volumes have been reproduced from punched cards by the IBM 407, a machine which does not print all characters exactly as they appear on a typewriter. Thus:

> % is actually (
>
> ¤ is actually)
>
> 0 is actually ? or !
>
> Apostrophes cannot be printed.

The number immediately after the statement of each objective represents the number of items measuring attainment of that objective.

Information on the EII publications or purchase requests can be directed to:

> INSTITUTE FOR EDUCATIONAL RESEARCH
> 1400 West Maple Avenue
> Downers Grove, Illinois 60515

NOTES TO USERS:

Even though the objectives and test questions included here have undergone numerous editings and proof readings, it is likely that a small number of errors still exist.

If any user reports an error (an incorrect answer, a misspelled word, etc.), the staff will be pleased to compile an errata sheet and make the necessary corrections for all subsequent printings.

In addition:

1. The number immediately after the statement of each objective represents the number of items measuring attainment of that objective.

2. The IBM 407 we used does not print all characters exactly as they appear on a typewriter; thus,

> % is actually (
> □ is actually)
> 0 is actually ? or !
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PRIMARY MATHEMATICS

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NUMBERS AND NUMERATION

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COUNTING

THE STUDENT DEMONSTRATES KNOWLEDGE OF SKIP COUNTING BY SKIP   0019
COUNTING BY 2, 5, 10, 100, 1000.

Directions: What is the next skip counting number? Circle
               the letter.

2 4 6 8 10 12.....   0001

 a. 13
*b. 14
 c. 15
 d. 16

5 10 15 20 25 30.....   0002

a. 31
b. 32
c. 40
*d. 35

10 20 30 40 50 60 70.....   0003

*a. 80
 b. 90
 c. 71
 d. 75

100 200 300 400 500.....   0004

a. 501
b. 510
*c. 600
d. 700

1000 2000 3000 4000.....   0005

a. 4001
b. 4010
*c. 5000
d. 6000

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THE CHILD WILL DISPLAY HIS ABILITY TO COUNT OBJECTS BY CHOOSING   0036
A NUMERAL TO REPRESENT THE NUMBER OF MEMBERS OF SETS UP TO TEN.

Directions: The teacher makes sets, one at a time, on the flannel-
board and provides three choices in felt numerals at
the side of the board. The child chooses the numeral
and places it next to the set.

[△ △ △ △   ]   0006

Child chooses:

    a.   6
    b.   2
 *c.   4
    d.   no response

[o o o o o o o o o o]   0007

Child chooses:

 *a.   10
    b.   7
    c.   3
    d.   no response

[▢ ▢ ▢ ▢ ▢ ▢ ▢ ▢]   0008

Child chooses:

    a.   6
 *b.   8
    c.   10
    d.   no response

[▢ ▢ ▢ ▢ ▢]   0009

Child chooses:

 *a.   5
    b.   3
    c.   6
    d.   no response

GIVEN A FLANNELBOARD ON WHICH ARE NUMERALS ONE THROUGH FIVE TO   0047
CHOOSE FROM, THE CHILD WILL DEMONSTRATE HIS KNOWLEDGE OF COUNTING
NUMBERS BY WRITING THE NEXT NUMERAL AT THE END OF THE SERIES WHICH
THE TEACHER WRITES ON THE CHALKBOARD.

Directions: Teacher says, "Write the numeral that comes next."

Teacher writes 1 2 3   0010

   a.   child writes 1
   b.   child writes 2
   c.   child writes 3
 *d.   child writes 4
   e.   child writes 5

Teacher writes 1 2 3 4   0011

   a.   child writes 1
   b.   child writes 2
   c.   child writes 3
   d.   child writes 4
 *e.   child writes 5

Teacher writes 1 2   0012

   a.   child writes 1
   b.   child writes 2
 *c.   child writes 3
   d.   child writes 4
   e.   child writes 5

Teacher writes 1   0013

   a.   child writes 1
 *b.   child writes 2
   c.   child writes 3
   d.   child writes 4
   e.   child writes 5

GIVEN A FLANNELBOARD ON WHICH ARE NUMERALS SIX THRU TEN TO CHOOSE   0048
FROM, THE CHILD WILL DEMONSTRATE HIS KNOWLEDGE OF COUNTING NUMBERS
BY WRITING THE NEXT NUMERAL AT THE END OF THE SERIES WHICH THE
TEACHER WRITES ON THE CHALKBOARD.

Directions: Teacher says, "Write the number that comes next."

Teacher writes 1 2 3 4 5 6 7   0014

    a.   child writes 6
    b.   child writes 7
  *c.   child writes 8
    d.   child writes 9
    e.   child writes 10

Teacher writes 1 2 3 4 5 6 7 8   0015

    a.   child writes 6
    b.   child writes 7
    c.   child writes 8
  *d.   child writes 9
    e.   child writes 10

Teacher writes 1 2 3 4 5   0016

  *a.   child writes 6
    b.   child writes 7
    c.   child writes 8
    d.   child writes 9
    e.   child writes 10

Teacher writes 1 2 3 4 5 6   0017

    a.   child writes 6
  *b.   child writes 7
    c.   child writes 8
    d.   child writes 9
    e.   child writes 10

Teacher writes 1 2 3 4 5 6 7 8 9   0018

    a. child writes 6
    b. child writes 7
    c. child writes 8
    d. child writes 9
    *e. child writes 10

THE CHILD WILL SHOW HIS KNOWLEDGE OF THE ORDERED SET OF COUNTING   0060
NUMBERS BY SUPPLYING THE CORRECT NUMERALS IN THE CORRECT POSITIONS
TO AN INCOMPLETE SET OF COUNTING NUMBERS.

2 ___ 4   0019

    a. child fills in numeral 6
    *b. child fills in numeral 3
    c. child fills in numeral 5
    d. no response

3 ___ 5   0020

    *a. child fills in numeral 4
    b. child fills in numeral 6
    c. child fills in numeral 2
    d. no response

7 ___ 9   0021

    a. child fills in 2
    b. child fills in 10
    *c. child fills in 8
    d. no response

PLACE HOLDERS AND VALUE

THE STUDENT CAN SHOW COMPREHENSION OF PLACEHOLDERS BY USING FASTER   0017
WAYS THAN COUNTING TO SOLVE PLACEHOLDER PROBLEMS.

Directions: Which is the slowest way to find the missing number?
               Circle the correct letter.

   + 6 = 15   0022

  a. 6 + 4 + 5 = 15
  b. 15 - 6 = 9
  c. 6 + 9 = 15
*d. Count from 6 to 15

17 -   = 9   0023

  a. 9 + 8 = 17
*b. Count back from 17 to 9
  c. 17 - 9 = 8
  c. 17 - 9 = 8
  d. 17 - 7 - 2 = 8

THE STUDENT DEMONSTRATES KNOWLEDGE OF PLACE VALUE BY IDENTIFYING   0018
PLACE VALUES IN FOUR DIGIT NUMERALS.

Directions: Circle the correct letter.

9527   In this number the 2 means 2...   0024

  a. ones
*b. tens
  c. hundreds
  d. thousands

6341 In this number the 6 means 6...   0025

    a. ones
    b. tens
    c. hundreds
 *d. thousands

1857 In this number the 8 means 8...   0026

    a. ones
    b. tens
 *c. hundreds
    d. thousands

2796 In this number the 6 means 6...   0027

 *a. ones
    b. tens
    c. hundreds
    d. thousands

THE CHILD WILL DEMONSTRATE HIS UNDERSTANDING OF PLACE VALUE BY   0075
BEING ABLE TO SELECT THE APPROPRIATE VALUE FOR A SPECIFIED NUMBER.

In the number 572 the 7 stands for _____. Circle the   0028
correct answer.

    a. 7 ones
 *b. 7 tens
    c. 7 hundreds

In the number 674 there are _____ hundreds. Circle the   0029
correct answer.

    a. 7
    b. 4
 *c. 6

In the number 403 there are _____ tens. Circle the correct
answer.   0030

   a. 4
   b. 3
*c. 0

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ORDER

THE CHILD WILL SHOW HIS KNOWLEDGE OF THE ORDERED SET OF COUNTING   0034
NUMBERS BY SUPPLYING THE CORRECT NUMERALS IN THE CORRECT POSITIONS
TO AN INCOMPLETE SET OF COUNTING KUMBERS.

Directions: The child sees the flannelboard on which are two
                numerals in a row, between which one is missing to
                make a complete part of the counting set. The
                teacher places three other numerals on the flannel-
                board in a list apart from the two numerals given.
                Teacher says: "Fill in the missing numeral by choos-
                ing one from this list."

1 ___ 3   0031

        *a.   child fills in numeral 2
         b.   child fills in numeral 5
         c.   child fills in numeral 6
         d.   child fills in no numeral

5 ___ 7   0032

         a.   child fills in numeral 3
        *b.   child fills in numeral 6
         c.   child fills in numeral 9
         d.   child fills in no numeral

6 ___ 8   0033

         a.   child fills in numeral 1
        *b.   child fills in numeral 7
         c.   child fills in numeral 10
         d.   child fills in no numeral

4 ___ 6   0034

        *a.   child fills in numeral 5
         b.   child fills in numeral 8
         c.   child fills in numeral 2
         d.   child fills in no numeral

6 ___ 10   0035

    a. child fills in numeral 6
    b. child fills in numeral 3
  *c. child fills in numeral 9
    d. child fills in no numeral

THE CHILD WILL DISPLAY HIS KNOWLEDGE OF ORDINAL WORDS — FIRST,   0037
SECOND, THIRD, FOURTH, FIFTH, BY NAMING THE ORDER POSITION OF
AN OBJECT IN A LINEAR SEQUENCE OF FIVE OBJECTS.

Directions: There is a row of five blocks.

The teacher points to the second block and asks the child, "Is   0036
this the first, second, third, fourth, or fifth block?"

    a. child says "first"
  *b. child says "second"
    c. child says "third"
    d. child says "fourth"
    e. child says "fifth"
    f. no response

Teacher points to fourth block and asks, "Is this, etc."   0037

    a. child says "first"
    b. child says "second"
    c. child says "third"
  *d. child says "fourth"
    e. child says "fifth"
    f. no response

Teacher points to first block   0038

  *a. child says "first"
    b. child says "second"
    c. child says "third"
    d. child says "fourth"
    e. child says "fifth"
    f. no response

GIVEN THREE NUMERALS, THE CHILD WILL DEMONSTRATE HIS KNOWLEDGE   0066
OF THE NUMERALS ONE TO TEN BY CHOOSING THE NUMERAL WHICH REPRE-
SENTS THE GREATEST OR SMALLEST NUMBER.

3, 5, 8 Teacher says, "Which numeral tells the greatest number?"   0039

    a. child says, "Three"
    b. child says, "Five"
   *c. child says, "Eight"
    d. no response

4, 7, 10 "Which numeral tells the greatest number?"   0040

    a. child says, "Four"
    b. child says, "Seven"
   *c. child says, "Ten"
    d. no response

10, 2, 4 "Which numeral tells the smallest number?"   0041

    a. child says, "Ten"
   *b. child says, "Two"
    c. child says, "Four"
    d. no response

6, 9, 3 "Which numeral tells the greatest number?"   0042

    a. child says, "Six"
   *b. child says, "Nine"
    c. child says, "Three"
    d. no response

6, 8, 9 "Which numeral tells the smallest number?"   0043

   *a. child says, "Six"
    b. child says, "Eight"
    c. child says, "Nine"
    d. no response

4, 5, 3 "Which numeral tells the smallest number?"   0044

   a. child says, "Four."
   b. child says, "Five."
*c. child says, "Three."
   d. no response

THE CHILD WILL DEMONSTRATE HIS KNOWLEDGE OF THE ORDER OF NUMBERS   0069
1 - 100 BY BEING ABLE TO SELECT A GROUP OF NUMBERS WHICH IS IN THE
CORRECT ORDER FROM AMONG SEVERAL GROUPS OF NUMBERS.

Circle the group of numbers below which is in the right order   0045
from smallest to largest.

a. 29	b. 79	c. 81	*d. 23
31	78	80	25
43	80	79	27
40	81	78	29

Circle the group of numbers below which is in the correct order   0046
from largest to smallest.

*a. 99	b. 18	c. 16	d. 18
97	17	17	27
96	15	18	46
90	16	19	32

Circle the group of numbers which is NOT in the correct order.   0047

a. 87	b. 91	*c. 95	d. 74
88	92	96	76
89	93	98	78
90	94	97	80

COMPARISON

THE STUDENT DEMONSTRATES KNOWLEDGE OF THE CONCEPT OF COMPARISON   0020
BY COMPARING NUMBERS TO HUNDREDS PLACE USING THE SIGNS FOR COM-
PARISON.

Directions: Find the one that is not correct and circle the
               letter.

```
  a.  65 >  60                                                     0048
  b.  38 >  33
  c.  49 <  59
 *d.  82 <  75
  e.  51 >  43
```

```
  a.  427 <  515                                                   0049
 *b.  913 <  678
  c.  835 >  822
  d.  365 <  761
  e.  598 >  588
```

THE STUDENT DEMONSTRATES KNOWLEDGE OF COMPARISON BY COMPARING   0021
EQUATIONS INVOLVING COMBINATIONS THROUGH 18 USING THE SIGNS
FOR COMPARISON.

Directions: Find the one that is not correct and circle the
               letter.

```
  a.  5 + 3 >  1 + 6                                               0050
  b.  4 + 2 <  8 + 1
  c.  6 + 2 =  1 + 7
 *d.  4 + 5 <  3 + 6
  e.  2 + 8 >  6 + 3
```

```
  a.  18 - 9 = 16 - 7                                              0051
 *b.   9 + 4 <  7 + 5
  c.  14 - 5 > 12 - 6
  d.  15 - 9 <  8 + 9
  e.   6 + 6 > 11 - 6
```

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FEWEST, MOST

GIVEN THREE SETS OF DIFFERENT NUMBERS, THE CHILD WILL DEMONSTRATE   0031
HIS KNOWLEDGE OF THE MEANING OF "FEWEST" AND "MOST" BY CHOOSING
A SET AT THE DIRECTION OF THE TEACHER.

Directions: On the flannel board is a set of two, a set of four,
               and a set of five objects. The teacher says, _____

"Choose the set that has the fewest members."   0052

 *a.   child points at [△ , △]

  b.   child points at [x x x x]

  c.   child points at [★ ★ ★ ★ ★]

  d.   child points at none

On the same flannel board: "Choose the set that has the most   0053
members."

  a.   child points at [△ △]

  b.   child points at [X X X X]

 *c.   child points at [★ ★ ★ ★ ★]

  d.   child points at none

PAIRS

GIVEN SIX ISOLATED OBJECTS, THE CHILD WILL DEMONSTRATE HIS KNOW-   0032
LEDGE OF THE MEANING OF THE WORD "PAIR" BY MAKING A PAIR FROM THE
SIX OBJECTS.

Directions: The child is presented with a row of six objects
               on the floor in front of him.   The teacher says, ——

"Choose enough objects to make a pair."   0054

    a.   child chooses three
    b.   child chooses one
  *c.   child chooses two
    d.   child chooses four
    e.   child chooses five
    f.   child chooses six
    g.   no response

ROMAN

THE PUPIL CAN DEMONSTRATE KNOWLEDGE OF ROMAN NUMERALS BY IDENTIFY-   0024
ING ROMAN NUMERALS THRU XII.

Directions: Sometimes we use Roman Numerals on a clock.   Circle
                the letter by the Roman numeral that stands

for 4   0055

   a. I
   b. III
 *c. IV
   d. II

for 8   0056

 *a. VIII
  b. VI
  c. VII
  d. V

for 10   0057

  a. XI
 *b. X
  c. IX
  d. XII

PROPERTIES

THE STUDENT CAN SHOW COMPREHENSION OF THE COMMUTATIVE PROPERTY   0004
OF ADDITION BY IDENTIFYING EXAMPLES.

Which equation shows the commutative property of addition. This   0058
means the order of the numbers has been changed. Circle the
letter.

   a. $3 + 2 = 5$
*b. $3 + 2 = 2 + 3$
   c. $(3 + 2) + 3 = 3 + (2 + 3)$
   d. $5 = 3 + 2$

   a. $(3 + 4) + 3 = 3 + (4 + 3)$ 0059
   b. $3 + 4 = 7$
*c. $3 + 4 = 4 + 3$
   d. $7 = 3 + 4$

THE STUDENT CAN DEMONSTRATE UNDERSTANDING OF THE ASSOCIATIVE   0005
PROPERTY BY IDENTIFYING EXAMPLES OF THE ASSOCIATIVE (OR GROUPING)
PROPERTY OF ADDITION.

Which equation shows the associative property of addition. This   0060
means the grouping has been changed. Circle the letter.

   a. $2 + 6 = 6 + 2$
   b. $2 + 6 = 8$
*c. $(2 + 6) + 1 = 2 + (6 + 1)$
   d. $6 + 1 = 7$

   a. $5 + 2 + 3 = 10$ 0061
   b. $5 + (2 + 3) = 5 + (3 + 2)$
   c. $3 + 2 + 5 = 10$
*d. $5 + (2+3) = (5 + 2) + 3$

GIVEN AN ARRAY THE STUDENT WILL APPLY HIS KNOWLEDGE OF THE DIS-   0085
TRIBUTIVE PROPERTY OF MULTIPLICATION BY PARTITIONING AN ARRAY INTO
SPECIFIED PARTS.

Which one of the following arrays shows the distributive property   0062
for a 2 x 5 array?

    a. x x x x x
        x x x x x

  *b. x x x x x
        x x x x x

    c. x x
        x x
        x x
        x x
        x x

Which one of the following arrays does **NOT** show the distributive   0063
property for a 3 x 4 array?

  *a. x x x x
        x x x x
        x x x x

    b. x x x
        x x x
        x x x
        x x x

    c. x x x x

        x x x x
        x x x x

Which one of the following arrays shows the distributive property   0064
for a 1 x 4 array?

    a. x x
        x x

    b. x
        x
        x
        x

Which one of the following arrays shows the distributive property   0065
for a 5 x 6 array?

*a. x x x   x x x
     x x x   x x x
     x x x   x x x
     x x x   x x x
     x x x   .x x x

 b. x x x x   x x
     x x x x   x x
     x x x x   x x
     x x x x   x x
     x x x x   x x
     x x x x   x x

 c. x x x x x x
     x x x x x x
     x x x x x x
     x x x x x x
     x x x x x x

Which one of the following arrays does <u>NOT</u> show the distributive   0066
property for a 2 x 3 array?

 a. x x   x
     x x   x

 b. x x   x
     x x .x
     x x   x

*c. x x x
     x x x

Which product shows the distributive property of the following   0067
array?   x x   x x x
              x x   x x x

 a. (2 x 2) + (1 x 3)
*b. (2 x 2) + (3 x 2)
 c. 2 x 3

Which product shows the distributive property of the following   0068
array?   x x x x
           x x x x
           x x x x

  a. $(1 \times 3) + (2 \times 3)$
  b. 4×3
*c. $(3 \times 3) + (1 \times 3)$

The product 5×6 can be partitioned to show the distributive   0069
property in all of the following arrays except:

  a. x x x x x
       x x x x x
       x x x x x

       x x x x x
       x x x x x

*b. x x x x x x
     x x x x x x

     x x x x x x
     x x x x x x

  c. x x x x x x
      x x x x x x
      x x x x x x
      x x x x x x

      x x x x x x

The product 2×4 can be partitioned to show the distributive   0070
property in all of the following arrays except:

  a. x x x x
      x x x x

  b. x x x x
      x x x x

*b. x x x x
      x x x x
      x x x x

The product 5 x 7 can be partitioned to show the distributive property in all of the following arrays except: 0071

a. X X X   X X X X
    X X X   X X X X

    X X X   X X X X
    X X X   X X X X
    X X X   X X X X

b. X X   X X X X X
    X X   X X X X X
    X X   X X X X X

    X X   X X X X X
    X X   X X X X X

*c. X X X X   X X X X
    X X X X   X X X X

    X X X X   X X X X
    X X X X   X X X X

FRACTIONS

THE STUDENT CAN DEMONSTRATE AN UNDERSTANDING OF COMMON FRACTIONS BY   0010
RECOGNIZING EXAMPLES OF THE FRACTIONAL NUMBERS 1/2, 2/3, 1/4 AND
3/4.

Directions: A set of 6:   XXXXXX

$\frac{1}{2}$ of 6 is   0072

    a. 2
  *b. 3
    c. 4
    d. 5

1/3 of 6 is   0073

  *a. 2
    b. 3
    c. 4
    d. 5

2/3 of 6 is   0074

    a. 2
    b. 3
  *c. 4
    d. 5

Directions: A set of 8:   XXXXXXXX

$\frac{1}{2}$ of 8 is   0075

    a. 2
    b. 3
  *c. 4
    d. 5
    e. 6

0076

$\frac{1}{4}$ of 8 is

    *a. 2
    b. 3
    c. 4
    d. 5
    e. 6

0077

3/4 of 8 is

    a. 2
    b. 3
    c. 4
    d. 5
    *e. 6

MATHEMATICAL SYMBOLS

THE CHILD WILL DEMONSTRATE HIS UNDERSTANDING OF THE MATHEMATICAL   0067
SYMBOLS +, -, x, ÷ BY BEING ABLE TO SUPPLY THE APPROPRIATE SYM-
BOL WHICH HAS BEEN DELETED FROM A SPECIFIED PROBLEM.

Circle the symbol below which would give you the right answer to   0078
the problem $7 \triangle 6 = 1$

   a. +
*b. -
   c. x
   d. ÷

Circle the symbol which would belong in the problem $8 \triangle 2 - 16$ 0079

*a. x
 b. +
 c. ÷
 d. -

THE CHILD WILL DEMONSTRATE HIS UNDERSTANDING OF MATHEMATICAL   0068
SYMBOLS BY SUPPLYING THE APPROPRIATE SYMBOL WHICH HAS BEEN DELETED
FROM A SPECIFIED PROBLEM.

Circle the symbol below which would belong in the problem   0080
$(3 + 7) + 3 \bigcirc 6 + 7$

  a. >
  b. <
*c. =

The symbol > would appear in which group of problems below? Circle   0081
the correct group.

  a. 7 ◯ 10   b. 10 ◯ 7   *c. 9 ◯ 2
      4 ◯ 6   4 ◯ 4   4 ◯ 1
      5 ◯ 5   7 ◯ 10   1 ◯ 0

The symbol   would appear in which group of problems below? Circle   0082
the correct group.

    a. (3 + 7) + 2   (4 + 2) + 1
             16   (3 + 2) + 6
      (7 + 1) + 3   11

 *b. (2 + 1) + 2   14
            13   10 + (2 + 3)
      (2 + 2) + 1   7 + 1

    c. (6 + 6) + 2   (2 + 6) + 6
            13   24
            18   16

ADDITION AND SUBTRACTION OF WHOLE NUMBERS

ADDITION

THE STUDENT CAN DEMONSTRATE AN UNDERSTANDING OF THE PROCESS OF   0001
SUMMING BY SOLVING COMBINATIONS AND EQUATIONS WHOSE SUMS ARE
LESS THAN TEN.

Directions: Circle the answers.

$$\begin{array}{r} 2 \\ +3 \\ \hline \end{array}$$
    A B C D E   0083
    3 4 (5) 6 7

$$\begin{array}{r} 4 \\ +3 \\ \hline \end{array}$$
  6 (7) 8 9 10   0084

$$\begin{array}{r} 7 \\ +2 \\ \hline \end{array}$$
  6 7 8 (9) 10   0085

$$\begin{array}{r} 4 \\ +4 \\ \hline \end{array}$$
  5 6 7 (8) 9   0086

$$\begin{array}{r} 2 \\ +8 \\ \hline \end{array}$$
  6 7 8 9 (10)   0087

$$\begin{array}{r} 5 \\ +1 \\ \hline \end{array}$$
  4 5 (6) 7 8   0088

Directions: Circle the Answers.

              A B C D
1 + 2 = 1   2 (3) 4 5   0089

7 + 3 = 6   7   8   9   (10)   0090

2 + 5 = 4   5   6 (7) 8   0091

6 + 2 = 6   7 (8) 9   10   0092

3 + 3 = 5 (6) 7   8   9   0093

5 + 4 = 6   7   8 (9) 10   0094

THE STUDENT CAN DEMONSTRATE AN UNDERSTANDING OF PLACEHOLDERS BY   0002
SOLVING PLACEHOLDER EQUATIONS WITH ADDEND AND SUM PLACEHOLDERS.

Directions: Circle the answers.

```
              A  B  C  D  E
2 + 2 = □     1  2  3 (4) 5                                     0095

9 + 1 = □     6  7  8  9 (10)                                   0096

3 + 5 = □     5  6  7 (8) 9                                     0097

4 + 2 = □     4  5 (6) 7  8                                     0098

6 + 3 = □     6  7  8 (9) 10                                    0099
```

1 + 6 = ☐   5   6   (7)   8   9   0100

Directions: Circle the answers.

            A   B   C   D   E
4 + ☐ = 5   (1) 2   3   4   5   0101

6 + ☐ = 10   2   3 (4) 5   6   0102

1 + ☐ = 8   6 (7) 8   9   10   0103

8 + ☐ = 9   (1) 2   3   4   5   0104

1 + ☐ = 10   6   7   8 (9) 10   0105

2 + ☐ = 6   3. (4) 5   6   7   0106

Directions: Circle the answers.

              A   B   C   D   E
☐ + 5 = 10   3   4 (5) 6   7   0107

☐ + 1 = 3   1 (2) 3   4   5   0108

☐ + 4 = 7   2 (3) 4   5   6   0109

49

□ + 2 = 10   5   6   7   (8)   9   0110

□ + 1 = 4   2 (3)   4   5   6   0111

□ + 8 = 9   (1) 2   3   4   5   C112

THE STUDENT CAN DEMONSTRATE UNDERSTANDING OF THE ADDITION PROCESS   0003
BY SOLVING ADDITION ALGORISMS WITH ADDEND AND SUM PLACEHOLDERS.

Directions: Circle the answer.

          A   B   C   D   E

4
+6
□   6   7   8   9   (10)   0113

1
+3
□   3 (4) 5   6   7   0114

2
+7
□   5   6   7   8   (9)   0115

1
+1
□   1 (2) 3   4   5   0116

5
+3
□   6   7 (8) 9   10   0117

$$\begin{array}{r} \square \\ +5 \\ \hline 6 \end{array}$$ (1) 2   3   4   5   0118

$$\begin{array}{r} \square \\ +1 \\ \hline 8 \end{array}$$ 6 (7) 8   9   10   0119

$$\begin{array}{r} \square \\ +6 \\ \hline 9 \end{array}$$ 2 (3) 4   5   6   0120

$$\begin{array}{r} \square \\ +2 \\ \hline 5 \end{array}$$ 1   2 (3) 4   5   0121

$$\begin{array}{r} \square \\ +4 \\ \hline 5 \end{array}$$ (1) 2   3   4   5   0122

$$\begin{array}{r} 3 \\ +\square \\ \hline 10 \end{array}$$ 4   5   6 (7) 8   0123

$$\begin{array}{r} 5 \\ +\square \\ \hline 7 \end{array}$$ 1 (2) 3   4   5   0124

$$\begin{array}{r} 4 \\ +\square \\ \hline 9 \end{array}$$ 3   4 (5) 6   7   0125

$$\begin{array}{r} 6 \\ +\ \square \\ \hline 7 \end{array}$$
(1) 2   3   4   5

0126

$$\begin{array}{r} 2 \\ +\ \square \\ \hline 8 \end{array}$$
5 (6) 7   8   9

0127

THE STUDENT CAN DEMONSTRATE AN UNDERSTANDING OF THE ADDITION
PROCESS BY SOLVING ADDITION PROBLEMS INVOLVING SUMS BETWEEN 11
AND 18 BY MAKING THE SECOND ADDEND A DIFFERENT NUMERAL. HE
THEN ADDS THE AMOUNT NEEDED TO MAKE 10 TO THE FIRST ADDEND.

0011

Directions: Choose the letter next to the missing number.

$5 + 7 = 5 + (5 + \square) =$

0128

$(5 + 5) + 2 = 10 + 2 = 12$

  a. 5
*b. 2
  c. 10
  d. 7

$9 + 9 = 9 + (\square + 8) =$

0129

$(9 + 1) + 8 = 10 + 8 = 18$

  a. 10
  b. 8
  c. 9
*d. 1

$8 + 6 = 8 + (2 + 4) =$ 0130

$(8 + \boxed{}) + 4 = 10 + 4 = 14$

*a.   2
 b.   8
 c.   4
 d.   6

$7 + 9 = 7 + (3 + 6) =$ 0131

$(7 + 3) + \boxed{} = 10 + 6 = 16$

 a.   3
 b.   9
*c.   6
 d.   7

THE STUDENT CAN DEMONSTRATE AN UNDERSTANDING OF THE ADDITION   0013
PROCESS BY SOLVING ADDITION PROBLEMS INVOLVING CARRYING AND USING
THE THREE-STEP APPROACH.

    1.   FIND THE NUMBER OF ONES WHICH CAN BE ADDED TO TENS TO
        GIVE THE SUM.
    2.   GROUP THE TENS.
    3.   TENS ADDED TO ONES.

Directions: Choose the letter next to the missing number.

$$\begin{array}{r} 20 + 5 \\ +60 + 8 \\ \hline 80 + 13 = \underline{\hspace{2cm}} \end{array} \qquad \begin{array}{r} 25 \\ +68 \\ \hline \end{array}$$
                                                               0132

 a.   84
*b.   93
 c.   12

$$\begin{array}{r} 40 + 7 \\ +20 + 4 \\ \hline 60 + 11 = \underline{\hspace{2cm}} \end{array} \qquad \begin{array}{r} 47 \\ +24 \\ \hline \end{array}$$
   0133

 a.   8
 b.   62
*c.   71

WHEN PRESENTED WITH TWO SETS OF OBJECTS WHICH WHEN ADDED TOGETHER   0054
EQUAL 5 OR LESS, AND ASKED TO JOIN THE TWO SETS TO MAKE ONE NEW
SET, THE CHILD WILL APPLY HIS UNDERSTANDING OF ADDITION BY CHOOS-
ING A NUMERAL TO REPRESENT THE NUMBER IN THE NEW SET.

Directions: The teacher will make two different sets on the
               flannel-board. The child will be asked to name
               the set and then choose a numeral 1 through 5,
               to tell the sum of the two sets.

The teacher makes two sets, $[\propto \quad \propto \quad]$ and $[\triangle \triangle \triangle \quad]$ and asks   0134
a child to tell the number of each set. Then the teacher says,
"Choose a numeral that tells how many members are in the new set,
when we join the two sets together."

    a. Child chooses 1
    b. Child chooses 2
    c. Child chooses 3
    d. Child chooses 4
    *e. Child chooses 5
    f. no response

The teacher makes two sets: $[\, O\,O\,O \,]$ and $[\bigstar]$. "Choose a   0135
numeral that tells how many members are in the new set when you
join them."

    a. Child chooses 1
    b. Child chooses 2
    c. Child chooses 3
    *d. Child chooses 4
    e. Child chooses 5
    f. no response

The teacher makes two sets $[\qquad]$ and $[O\,O\,O\,O\,O]$. "Choose the   0136
numeral to name the new set."

    a. Child chooses 1
    b. Child chooses 2
    c. Child chooses 3
    d. Child chooses 4
    *e. Child chooses 5
    f. no response

The teacher makes two sets: [□ □] and [○]. "Choose the numeral   0137
that names the new set."

    a. Child chooses 1
    b. Child chooses 2
  *c. Child chooses 3
    d. Child chooses 4
    e. Child chooses 5
    f. no response

The teacher makes two sets: [△] and [□]. "Choose the numeral   0138
that names the new set."

    a. Child chooses 1
  *b. Child chooses 2
    c. Child chooses 3
    d. Child chooses 4
    e. Child chooses 5
    f. no response

The teacher makes two new sets: [   ] and [♀♀]. "Choose the numeral 0139
that names the new set."

    a. Child chooses 1
  *b. Child chooses 2
    c. Child chooses 3
    d. Child chooses 4
    e. Child chooses 5
    f. no response

THE CHILD WILL DEMONSTRATE HIS UNDERSTANDING OF CARRYING INTO THE   0070
NEXT COLUMN IN ADDITION BY BEING ABLE TO CHOOSE THE CORRECT COLUMN
IN WHICH A NUMBER HAS TO BE CARRIED IN A GIVEN PROBLEM.

In the problem $\begin{array}{r}213\\+327\\\hline 540\end{array}$ I had too many ones in the ones column. Circle   0140
the name of the column into which I would carry the extra group of
ones.

    a. the ones column
  *b. the tens column
    c. the hundreds column

In the problem $\begin{array}{r} 24,912 \\ +14,327 \\ \hline 39,239 \end{array}$ I had to carry from the _____ column 0141

into the _____ column. Circle the correct paired choice below.

    a. ones to tens
    b. tens to hundreds
  *c. hundreds to thousands
    d. thousands to ten thousands

THE CHILD WILL DEMONSTRATE HIS UNDERSTANDING OF CARRYING INTO THE   0071
NEXT COLUMN IN ADDITION BY BEING ABLE TO CHOOSE THE PROBLEM IN
WHICH A MISTAKE IN CARRYING HAS BEEN MADE FROM AMONG A GROUP OF
PROBLEMS.

Circle the problem below in which there is a mistake in carrying.   0142

  a. $\begin{array}{r} 1,796 \\ + 279 \\ \hline 2,075 \end{array}$ *b. $\begin{array}{r} 2,712 \\ +1,219 \\ \hline 4,021 \end{array}$ c. $\begin{array}{r} 672 \\ +1,000 \\ \hline 1,672 \end{array}$

THE CHILD WILL DEMONSTRATE HIS KNOWLEDGE THAT MANY DIFFERENT COM-   0078
BINATIONS OF NUMERALS ADDED TOGETHER CAN EQUAL THE SAME SPECIFIC
NUMBER BY SELECTING A COMBINATION OF NUMERALS THAT WOULD BE THE
SAME AS A SPECIFIED NUMBER.

4 + 4 stands for the same numeral as _____. Circle the   0143
correct answer.

    a. 3 + 2
  *b. 2 + 6
    c. 4 + 5

Circle the group of numerals below which is the same as the numeral 0144
9.

a. 4 + 2 + 2	b. 6 + 1 + 1	*c. 3 + 3 + 3
6 + 2	3 + 2 + 1	7 + 2
9 + 1	5 + 2	8 + 1

SUBTRACTION

THE STUDENT CAN DEMONSTRATE UNDERSTANDING OF THE SUBTRACTION 　　　0014
PROCESS BY SOLVING SUBTRACTION COMBINATIONS AND EQUATIONS WHOSE
DIFFERENCES ARE LESS THAN TEN.

Directions:　　Circle the answers.

$$\begin{array}{r} 5 \\ -3 \\ \hline \square \end{array}$$
　　1 (2)　3　4　5　　　　　　　　　　0145

$$\begin{array}{r} 7 \\ -3 \\ \hline \square \end{array}$$
　　1　2　3 (4) 5　　　　　　　　　　0146

$$\begin{array}{r} 9 \\ -2 \\ \hline \square \end{array}$$
　　4　5　6 (7) 8　　　　　　　　　　0147

$$\begin{array}{r} 8 \\ -4 \\ \hline \square \end{array}$$
　　2　3 (4) 5　6　　　　　　　　　　0148

$$\begin{array}{r} 10 \\ -8 \\ \hline \square \end{array}$$
　　(2) 3　4　5　6　　　　　　　　　　0149

$$\begin{array}{r} 6 \\ -1 \\ \hline \square \end{array}$$
　　1　2　3　4 (5)　　　　　　　　　　0150

$3 - 2 = \square$　(1) 2　3　4　5　　　　　　　　0151

$10 - 3 = \square$　5　6　(7) 8　9　　　　　　　0152

$7 - 5 =$ ☐   1 (2)   3   4   5   0153

$8 - 2 =$ ☐   3   4   5   (6)   7   0154

$6 - 3 =$ ☐   1   2   (3)   4   5   0155

$9 - 4 =$ ☐   3   4   (5)   6   7   0156

THE STUDENT CAN DEMONSTRATE UNDERSTANDING OF THE SUBTRACTION   0015
PROCESS BY SOLVING SUBTRACTION EQUATIONS WHOSE DIFFERENCES ARE
LESS THAN TEN WITH PLACEHOLDERS IN ALL POSITIONS.

Directions: Circle the answers.

$4 - 2 =$ ☐   1   (2)   3   4   5   0157

$10 - 1 =$ ☐   5   6   7   8   (9)   0158

$8 - 5 =$ ☐   1   2   (3)   4   5   0159

$6 - 2 =$ ☐   1   2   3   (4)   5   0160

$9 - 3 =$ ☐   4   5   (6)   7   8   0161

$7 - 6 =$ ☐   (1)   2   3   4   5   0162

$5 - \square = 4$	(1)	2	3	4	5			0163
$10 - \square = 6$	1	2	3	(4)	5			0164
$8 - \square = 1$	3	4	5	6	(7)			0165
$9 - \square = 8$	(1)	2	3	4	5			0166
$10 - \square = 1$	5	6	7	8	(9)			0167
$6 - \square = 2$	1	2	3	(4)	5			0168
$\square - 5 = 5$	6	7	8	9	(10)			0169
$\square - 1 = 2$	1	2	(3)	4	5			0170
$\square - 4 = 3$	6	(7)	8	9	10			0171
$\square - 8 = 1$	6	7	8	(9)	10			0172
$\square - 2 = 3$	6	7	8	9	(10)			0173
$\square - 1 = 3$	1	2	3	(4)	5			0174

THE STUDENT CAN DEMONSTRATE UNDERSTANDING OF THE SUBTRACTION
PROCESS BY SOLVING SUBTRACTION ALGORISMS WHOSE DIFFERENCES ARE
LESS THAN TEN WITH PLACEHOLDERS IN ALL POSITIONS.   0016

Directions: Circle the answers.

$$\begin{array}{r} 10 \\ -\ 6 \\ \hline \square \end{array}$$

2   3   (4)   5   6   0175

$$\begin{array}{r} 4 \\ -3 \\ \hline \square \end{array}$$

(1)   2   3   4   5   0176

$$\begin{array}{r} 9 \\ -7 \\ \hline \square \end{array}$$

1   (2)   3   4   5   0177

$$\begin{array}{r} 2 \\ -1 \\ \hline \square \end{array}$$

(1)   2   3   4   5   0178

$$\begin{array}{r} 8 \\ -3 \\ \hline \square \end{array}$$

2   3   4   (5)   6   0179

$$\begin{array}{r} \square \\ -5 \\ \hline 1 \end{array}$$

5   (6)   7   8   9   0180

$$\begin{array}{r} \square \\ -6 \\ \hline 3 \end{array}$$

6   7   8   (9)   10   0181

$$\begin{array}{r} \square \\ -1 \\ \hline 7 \end{array}$$

6   7   (8)   9   10   0182

$$\begin{array}{r} \square \\ \underline{-2} \\ 3 \end{array}$$

4 (5) 6 7 8   .0183

$$\begin{array}{r} \square \\ \underline{-4} \\ 1 \end{array}$$

4 (5) 6 7 8   0184

$$\begin{array}{r} 10 \\ -\square \\ \hline 3 \end{array}$$

4 5 6 (7) 8   0185

$$\begin{array}{r} 7 \\ -\square \\ \hline 5 \end{array}$$

1 (2) 3 4 5   0186

$$\begin{array}{r} 9 \\ -\square \\ \hline 4 \end{array}$$

3 4 (5) 6 7   0187

$$\begin{array}{r} 7 \\ -\square \\ \hline 6 \end{array}$$

(1) 2 3 4 5   0188

$$\begin{array}{r} 8 \\ -\square \\ \hline 2 \end{array}$$

2 3 4 5 (6)   0189

THE CHILD WILL DEMONSTRATE HIS UNDERSTANDING OF BORROWING BY   0072
BEING ABLE TO SELECT THE CORRECT COLUMN FROM WHICH A NUMBER
HAS TO BE BORROWED IN A SPECIFIED PROBLEM.

In the problem $\begin{array}{r} 902 \\ \underline{-311} \\ 591 \end{array}$ I had to borrow from which column? Circle the   0190

correct answer.

    a. the ones column
    b. the tens column
    *c. the hundreds column   62

THE CHILD WILL DEMONSTRATE HIS UNDERSTANDING OF BORROWING BY BEING   0073
ABLE TO SELECT THE PROBLEM IN WHICH A MISTAKE IN BORROWING HAD
BEEN MADE FROM AMONG A GROUP OF CORRECT PROBLEMS.

Circle the problem below in which there is a mistake in borrowing.   0191

*a.	00,032	b.	7,312	c.	8,416
	− 920		− 92		−2,210
	00,112		7,220		6,206

Circle the problem below in which there is a mistake in borrowing.   0192

a.	6,198	*b.	7,316	c.	1,089
	−3,212		−2,435		− 999
	2,986		3,971		0,090

ADDITION AND SUBTRACTION

THE STUDENT DEMONSTRATES UNDERSTANDING OF THE RELATION BETWEEN   0022
ADDITION AND SUBTRACTION BY RECOGNIZING RELATED ADDITION AND
SUBTRACTION COMBINATIONS.

Here are three equations.

$$3 + 5 = 8$$
$$5 + 3 = 8$$
$$8 - 3 = 5$$

Which one of these equations is like the above three?   0193

 a. $8 - 4 = 4$
*b. $8 - 5 = 3$
 c. $6 + 2 = 8$
 d. $8 - 6 = 2$

Here are three equations.

$$10 - 4 = 6$$
$$4 + 6 = 10$$
$$10 - 6 = 4$$

Which one of these is like the above three?   0194

 a. $10 - 3 = 7$
 b. $5 + 5 = 10$
 c. $10 - 5 = 5$
*d. $6 + 4 = 10$

Here are three equations.

$$14 - 8 = 6$$
$$14 - 6 = 8$$
$$6 + 8 = 14$$

Which one of these is like the above three?   0195

 a. $9 + 5 = 14$
 b. $14 - 7 = 7$
*c. $8 + 6 = 14$
 d. $7 + 7 = 14$

THE PUPIL CAN DEMONSTRATE UNDERSTANDING OF THE ADDITION AND SUB-   0023
TRACTION PROCESSES BY USING ADDITION AND SUBTRACTION TO FIND A
FINAL MISSING NUMBER.

Directions: Find the missing numbers.   Circle the letter beside
the last missing number.

$8 + 8$ ____ $- 3$ ____ $+ 2$ ____ $- 9$ ____ $+ 4 =$ ____   0196

    a.   8
    b.   9
 *c.   10
    d.   11
    e.   12

$3 + 7$ ____ $+ 4$ ____ $- 6$ ____ $+ 10$ ____ $- 9 =$ ____   0197

    a.   6
    b.   7
    c.   8
 *d.   9
    e.   10

$12 + 33$ ____ $+ 54$ ____ $- 76$ ____ $- 11$ ____ $+ 76 =$ ____   0198

    a.   44
    b.   55
    c.   66
    d.   77
 *e.   88

$6 + 19$ ____ $+ 18$ ____ $- 14$ ____ $+ 36 =$ ____   0199

    a.   63
 *b.   65
    c.   72
    d.   86
    e.   55

THE STUDENT CAN SHOW COMPREHENSION OF THE ADDITION AND SUBTRACTION   0025
PROCESSES BY SOLVING ADDITION AND RELATED SUBTRACTION ALGORISMS
THRU 19   INVOLVING A TWO-DIGIT ADDEND AND A ONE-DIGIT ADDEND.

Directions: Addition. Circle the answer.

11 + 4	*15	16	17	18	19	0200
14 + 2	15	*16	17	18	19	0201
17 + 2	15	16	17	18	*19	0202
12 + 6	15	16	17	*18	19	0203
15 + 2	15	16	*17	18	19	0204
12 + 7	15	16	17	18	*19	0205
13 + 5	15	16	17	*18	19	0206
12 + 3	*15	16	17	18	19	0207

```
  11
 + 6        15     16    *17     18     19                    0208
```

```
  14
 + 4        15     16     17    *18     19                    0209
```

Subtraction. Circle the answer.

```
  19
 - 8        *11     12     13     14     15                   0210
```

```
  16
 - 3         11     12    *13     14     15                   0211
```

```
  14
 - 3        *11     12     13     14     15                   0212
```

```
  18
 - 3         11     12     13     14    *15                   0213
```

```
  17
 - 5         11    *12     13     14     15                   0214
```

```
  19
 - 4         11     12     13     14    *15                   0215
```

```
  17
 - 3         11     12     13    *14     15                   0216
```

$$\begin{array}{r} 18 \\ -7 \\ \hline \end{array}$$ *11   12   13   14   15   0217

$$\begin{array}{r} 16 \\ -4 \\ \hline \end{array}$$ 11   *12   13   14   15   0218

$$\begin{array}{r} 19 \\ -6 \\ \hline \end{array}$$ 11   12   *13   14   15   0219

THE STUDENT DEMONSTRATES UNDERSTANDING OF THE ADDITION AND SUB-   0027
TRACTION PROCESSES BY SOLVING STORY PROBLEMS INVOLVING ADDITION
AND SUBTRACTION COMBINATIONS THRU 19 WITH A TWO DIGIT ADDEND AND
A ONE DIGIT ADDEND.

Directions: The second grade likes to play games. Here are
the scores for one game. Add the scores and
circle the letter that shows who won.

Team 1	Team 2
1	4
2	1
4	3
2	1
3	4
4	2
1	3
2	1

a. Team 1   0220
*b. A tie
c. Team 2

The next day the class played another game. It had three teams. Who won?

Team 1	Team 2	Team 3
3	2	4
5	3	1
1	5	2
4	3	4
3	2	3
1	3	5

a. Team 1   0221
b. A tie
c. Team 2
*d. Team 3

THE STUDENT DEMONSTRATES UNDERSTANDING OF ADDITION AND SUBTRACTION   0026
PROCESSES BY SOLVING STORY PROBLEMS INVOLVING TWO DIGIT ADDITION
AND SUBTRACTION COMBINATIONS WITH CARRYING.

Directions: Read the story problems and circle the letter with
                 the correct answer.

Jack's family drove to the lake on Saturday. They drove 135 miles   0222
on the way to the lake and 139 miles on the way back. How many
miles did they drive both ways?

a. 264
b. 374
*c. 274
d. 263

The family went for a boat ride. They could be out on the lake for   0223
60 minutes. After 35 minutes how many more minutes did they have
to stay out?

a. 35
b. 15
c. 95
*d. 25

Jack's mother bought some things to take home. She bought apples   0224
for 55¢ and some corn for 37¢. How much did she spend?

    a. 82¢
  *b. 92¢
    c. 93¢
    d. 72¢

Jack's sister bought some candy to eat on the way home. She had   0225
50¢. She spent 36¢. How much did she have left?

  *a. 14¢
    b. 24¢
    c. 86¢
    d. 15¢

THE PUPIL DEMONSTRATES UNDERSTANDING OF SUBTRACTION BY SOLVING   0030
STORY PROBLEMS INVOLVING 2 DIGIT ADDITION AND SUBTRACTION COMBINATIONS
WITHOUT CARRYING OR BORROWING.

Directions: Work the story problems and circle the letter with
              the answer.

One second grade has many good books. There are 32 readers and   0226
65 trade books. How many books are in their library?

    a. 33
    b. 87
  *c. 97
    d. 96

By spring one boy read 78 books. His friend read 53. How many   0227
more books did one boy read?

    a. 35
    b. 26
    c. 14
  *d. 25

One girl read 85 books. Her friend read 41 books. How many   0228
fewer books did her friend read?

    a. 53
  *b. 44
    c. 54
    d. 45

One book was well liked. 23 children read it once. 16 children   0229
read it again. How many times was the book read?

  *a. 39
    b. 49
    c. 38
    d. 57

MULTIPLICATION AND DIVISION OF WHOLE NUMBERS

MULTIPLICATION

THE PUPIL CAN SHOW UNDERSTANDING OF MULTIPLICATION FACTS BY COM-
PARING MULTIPLICATION FACTS THROUGH 5 USING THE SIGNS FOR COMPAR-
ISON.

0026

Directions: The sign is missing. Circle the sign that is miss-
                ing. Do not write in the problem.

> greater than

< less than

= equals

2 + 2 + 2 ◯ 3 x 2   =   >   <   0230

4 x 4   ◯   3 x 3   -   >   <   0231

2 x 2   ◯   1 x 5   =   >   <   0232

2 x 4   ◯   4 x 2   =   >   <   0233

1 + 1 + 1 + 1◯3 x 1 =   >   <   0234

5 x 5   ◯   25   =   >   <   0235

4 x 3   ◯   3 x 4   =   >   <   0236

2 x 3   ◯   5 x 1   =   >   <   0237

5 x 2   ◯   5 x 3   =   >   <   0238

5 x 4   ◯   4 x 5   =   >   <   0239

75

THE STUDENT WILL DEMONSTRATE HIS KNOWLEDGE OF AN ARRAY BY SELECT-   0079
ING ITS DEFINITION.

What is an array?   0240

    a. A scattered arrangement of like objects.
  *b. An orderly arrangement of like objects.
    c. A random arrangement of like objects.

What is the number of an array called?   0241

  *a. The product
    b. The sum
    c. The difference

What kind of objects must an array have?   0242

    a. All different objects
  *b. All the same objects
    c. It doesn't matter

THE STUDENT WILL BE ABLE TO DEMONSTRATE HIS KNOWLEDGE OF AN ARRAY   0080
BY IDENTIFYING ARRANGEMENTS OF ARRAYS.

Which one of the following arrangements is an array?   0243

  a.

  b.

 *c.

Which one of the following arrangements is <u>not</u> an array?   0244

    *a. ∴ ⋅

    b. ⦂⦂⦂

    c. ⋅ ⋅ ⋅ ⋅ ⋅ ⋅

Which one of the following arrangements shows an array?   0245

    a. OXO
         OXO

    *b. XXXX
         XXXX

    c. OZXO
         XOZX

Which one of the following is NOT an example of an array?   0246

    *a. The apples on a tree
    b. The rows of desk
    c. The tiles on the floor

THE STUDENT WILL BE ABLE TO DEMONSTRATE HIS COMPREHENSION OF AN   0081
ARRAY BY TRANSLATING AN ARRAY INTO TWO FORMS FOR THE PRODUCT.

What are the 2 forms for the product of the following array?   0247

        ○ ○ ○
        ○ ○ ○

    a. 3 x 6 and 6 x 3
    *b. 2 x 3 and 3 x 2
    c. 2 x 3 and 6 x 1

Which alternative is <u>not</u> a form for the following array? OOOOO 0248
                                               OOOOO

    a. 2 x 5
    b. 5 x 2
    *c. 10

What are the 2 forms for the product of 6 rows of desks with 4   0249
desks in each row?

   *a.   6 x 4 or 4 x 6
    b.   2 x 6 or 6 x 2
    c.   2 x 6 or 6 x 4

What are the 2 forms for the product of the following array?   0250

             : : : :
             : : : :
             : : : :

    a.   3 x 5 and 5 x 3
    b.   3 x 3 and 4 x 4
   *c.   3 x 4 and 4 x 3

THE CHILD WILL APPLY HIS KNOWLEDGE OF AN ARRAY BY CORRECTLY   0082
IDENTIFYING THE PRODUCT OF A GIVEN ARRAY.

What is the product of the following array?   XXX   0251
                                           XXX

   *a.   2 x 3 or 3 x 2
    b.   3 x 5 or 5 x 0
    c.   2 x 4 or 4 x 2

What is the product of the following array?   XXXXX   0252

    a.   1 x 5 or 5 x 0
   *b.   1 x 5 or 5 x 1
    c.   1 x 5 or 0 x 5

Which array would show the product 6 x 2?   0253

   *a.   XXXXXX
          XXXXXX
    b.   12

    c.   XXXXX
          XXXXX

Which alternative is <u>not</u> the product of the following array? .   0254

OO
OO
OO

   a. 2 x 3
   b. 3 x 2
*c. 3 x 1

Which one of the following products is the same as a 2 x 4 array?   0255

*a. 8 x 1
  b. 3 x 2
  c. 4 x 3

Which one of the following products is the same as a 6 x 2 array?   0256

  a. 15
*b. 12
  c. 62

Which one of the following is the product and array of the number   0257
6?

  a. 6 x 0   XXXXXX
  b. 6 x 1   XXXXXX
*c. 3 x 2   XXX
              XXX

Which one of the following is <u>not</u> the product and array of the   0258
number 4?

  a. 1 x 4   • • • •

  b. 2 x 2   • •
               • •

*c. 4 x 0   • • • •

Which one of the following is <u>not</u> the product and array of the   0259
number 2?

  a. 1 x 2 • •

*b. 2 x 0 •
           •

  c. 2 x 1 • •

THE STUDENT WILL APPLY HIS KNOWLEDGE OF AN ARRAY BY IDENTIFYING   0083
FACTORS IN A GIVEN ARRAY.

What are the factors of the following array?   XXX   0260
                                      XXX

  a. 2 and 4
*b. 3 and 2
  c. 3 and 1

What are the factors of the following array? ★ ★ ★ ★   0261
                                         ★ ★ ★ ★

*a. 4 and 2
  b. 2 and 5
  c. 4 and 3

Which one of these alternatives is <u>not</u> a factor of the following   0262
array?   88888
           88888

  a. 2
  b. 5
*c. 10

Which one of these alternatives is <u>not</u> a factor of the following   0263
array?   XXXXXX
           XXXXXX
           XXXXXX

  a. 3
  b. 6
*c. 18

What are the factors of the following array? ☆ ☆ ☆   0264
                                               ☆ ☆ ☆
                                               ☆ ☆ ☆

    *a. 3 and 3
     b. 9 and 1
     c. 3 x 3

What are the factors of the following array?   ZZZZZZ   0265

     a. 6 and 7
    *b. 6 and 1
     c. 6 and 0

Which array would contain the factors 6 and 2?   0266

    a. XXXXXX

    b. XXX
        XXX

   *c. XXXXXX
        XXXXXX

Which array would <u>not</u> contain the factors 5 and 2?   0267

    a. • • • • •
        • • • • •

    b. ::
        ::
        • •
        • •

   *c. • • • • •

What are the factors of the following array?   XXX   0268
                                                XXX

    *a. 2 and 3
     b. 2 + 3
     c. 2 x 3

GIVEN A PRODUCT, THE STUDENT WILL DEMONSTRATE HIS KNOWLEDGE OF   0084
THE DISTRIBUTIVE PROPERTY OF MULTIPLICATION IN AN ARRAY BY IDENTI-
FYING THE EQUAL SUM OF TWO OR MORE PRODUCTS.

The product 3 x 5 of the array x x x   is equal to: 0269
                       x x x
                       x x x
                       x x x
                       x x x

*a. $(1 \times 5) + (2 \times 5)$
 b. $(1 \times 4) + (1 \times 1)$
 c. $(5 \times 3) + (1 \times 1)$

The product 6 x 2 of the array x x x   x x x   is equal to: 0270
                            x x x   x x x

 a. $(2 \times 2) + (4 \times 2)$
 b. $(1 \times 1) + (5 \times 2)$
*c. $(3 \times 2) + (3 \times 2)$

The product 4 x 2 of the array   x x   x x   is equal to: 0271
                             x x   x x

 a. $(2 + 2) + (2 \quad 2)$
 b. $(2 \times 4) + (2 \times 4)$
*c. $(2 \times 2) + (2 \times 2)$

The product 3 x 3 of the array   x x   x   is equal to: 0272
                             x x   x
                             x x   x

*a. $(2 \times 3) + (1 \times 3)$
 b. $(2 + 3) + (3 \times 1)$
 c. $(3 \times 3) + (2 \times 3)$

The product 4 x 1 of the array   x   is equal to: O273
x
x
x

```
 a.  (1 x 2) x (1 x 2) = 4 x 1
*b.  (2 x 1) + (2 x 1) = 4 x 1
 c.  (4 x 1) + (4 x 1) = 4 x 1
```

The product 5 x 4 of the array   x x x   x x   is equal to <u>all</u>   O274
of the following equations   x x x   x x
<u>except</u>:   x x x   x x
                               x x x   x x

```
 a.  (3 x 4) + (2 x 4) = 5 x 4
 b.  (4 x 3) + (4 x 2) = 5 x 4
*c.  (3 + 4) + (2 + 4) = 5 x 4
```

The product 2 x 3 of the array   x   x x   is equal to all of the   O275
following equations <u>except</u>:   x   x x

```
 a.  (1 x 1) + (2 x 2) = 2 x 3
*b.  (1 x 2) + (2 x 2) = 2 x 3
 c.  (2 x 1) + (2 x 2) = 2 x 3
```

The product 4 x 5 of the array   x x   x x   is equal to all of the   O276
following equations <u>except</u>:   x x   x x
                               x x   x x
                               x x   x x
                               x x   x x

```
 a.  (2 x 2) + (2 x 2) + (3 x 2) + (3 x 2) = 4 x 5
 b.  (2 x 3) + (2 x 2) + (3 x 2) + (2 x 2) = 4 x 5
*c.  (3 x 2) + (3 x 2) + (2 x 2) + (3 x 2) = 4 x 5
 d.  (3 x 2) + (2 x 2) + (2 x 2) + (2 x 3) = 4 x 5
```

The product 6 x 2 of the array   x x x   x x x   is equal to all   0277
of the following equations   x x x   x x x
EXCEPT:

    a. $(3 \times 1) + (3 \times 1) + (3 \times 1) + (3 \times 1) = 6 \times 2$
    b. $(1 \times 3) + (1 \times 3) + (1 \times 3) + (1 \times 3) = 6 \times 2$
    c. $(1 \times 3) + (3 \times 1) + (1 \times 3) + (3 \times 1) = 6 \times 2$
*d. $(3 \times 6) + (3 \times 1) + (3 \times 6) + (3 \times 1) = 6 \times 2$

The product 7 x 3 of the array   x x x   x x x x is equal to all   0278
of the following equations
EXCEPT: x x x   x x x x
                        x x x   x x x x

*a. $(3 \times 1) + (2 \times 3) + (1 \times 4) + (2 \times 3) = 7 \times 3$
    b. $(1 \times 3) + (1 \times 4) + (2 \times 3) + (2 \times 4) = 7 \times 3$
    c. $(3 \times 1) + (3 \times 2) + (4 \times 1) + (4 \times 2) = 7 \times 3$
    d. $(3 \times 2) + (4 \times 2) + (3 \times 1) + (4 \times 1) = 7 \times 3$

THE STUDENT WILL DEMONSTRATE HIS KNOWLEDGE OF A THREE DIMENSIONAL   0086
ARRAY BY CORRECTLY IDENTIFYING THE PRODUCT OF A GIVEN ARRAY.

An array of 6 blocks wide, 3 blocks long and 2 blocks deep can   0279
be expressed by all of the following products except:

    a. $(3 \times 2) \times 6$
*b. $3 \times (4 \times 6)$
    c. $6 \times (3 \times 2)$
    d. $2 \times 6 \times 3$

An array of 7 cubes wide, 3 cubes deep and 18 cubes long can be   0280
expressed by all of the following products except:

    a. $18 \times (7 \times 3)$
    b. $7 \times 18 \times 3$
    c. $(3 \times 18) \times 7$
*d. $18 + (3 + 7)$

An array of 6 cans high, 1 can deep and 5 cans wide can be ex-   0281
pressed by all of the following products except:

  *a.   6 + (1 + 5)
   b.   (1 x 5) x 6
   c.   6 x (1 ⊤ 5)
   d.   6 x 5 x 1

An array of 3 desks wide, 7 desks long and 2 desks high can be   0282
expressed by all of the following products except:

   a.   (2 x 3) x 7
   b.   7 x (3 x 2)
  *c.   (2 + 3) x 7
   d.   2 x (7 x 3)

An array of 10 books high, 12 books long and 17 books deep can be   0283
expressed by all of the following products except:

   a.   (17 x 12) x 10
   b.   10 x (12 x 17)
   c.   12 x 17 x 12
  *d.   10 x (12 + 17)

An array of 3 chairs deep, 6 chairs long and 8 chairs high would   0284
be expressed by the following product:

   a.   3 + 6 + 8
  *b.   3 x (6 x 8)
   c.   3 x (6 + 8)
   d.   (3 x 6) + 8

An array of 3 glasses high, 7 glasses wide and 11 glasses deep is   0285
expressed by the following product:

  *a.   3 x (7 x 11)
   b.   (3 x 7) + 11
   c.   3 x (11 + 7)
   d.   7 x (3 + 11)

An array of 2 blocks wide, 7 blocks deep and 10 blocks high is   0286
expressed by the following product:

   a. 10 x (2 + 7)
   b. 2 + 10 ÷ 7
   c. 10 x (7 + 2)
*d. 2 x (10 x 7)

An array of 1 block wide, 1 block deep, and 1 block high can be   0287
expressed by all of the following products except:

   a. 1 x 1 x 1
   b. 1 x (1 x 1)
   c. (1 x 1) x 1
*d. (1 + 1) + 1

THE STUDENT WILL DEMONSTRATE HIS KNOWLEDGE OF THE COUNT OF AN   0088
ARRAY'S PRODUCT BY IDENTIFYING THE COUNT WITH A NUMERAL.

Which numeral tells the count of the following array? x x   0288
                                           x x

   a. 2
*b. 4
   c. 2 x 2

Which numeral tells the count of the following array? x x x x x   0289
                                         x x x x x

*a. 10
   b. 2 x 5
   c. 5

Which numeral tells the count of the following array? x x x x   0290
                                         x x x x

   a. 4 x 2
   b. 7
*c. 8

Which numeral tells the count of the following array?   x x x   0291
                                                          x x x
                                                          x x x

    a. 3 x 3
    b. 3
    *c. 9

Which numeral tells the count of the following array?   x x x x   0292
                                                          x x x x
                                                          x x x x

    a. 3 x 4
    *b. 12
    c. 7

Which numeral tells the count of the following array?   0293
x x x x x x x
x x x x x x x
x x x x x x x

    a. 7 x 3
    b. 22
    *c. 21

Which numeral tells the count of the following array?   0294
x x x x x x x x
x x x x x x x x

    *a. 16
    b. 15
    c. 8 x 2

Which numeral tells the count of the following array?   x x x x x   0295
                                                          x x x x x
                                                          x x x x x

    a. 3 x 5
    b. 14
    *c. 15

Which numeral tells the count of the following array?   0296

x x x x x x x x x x
x x x x x x x x x x

   *a. 20
    b. 19
    c. 21

Which numeral tells the count of the following array?   x x x x   0297
                                              x x x x
                                            x x x x
                                            x x x x

    a. 4 x 4
  *b. 16
    c. 15

Which numeral tells the count of the following array?   x x   0298
                                              x x
                                            x x

    a. 2
    b. 3
  *c. 6

Which numeral tells the count of the following array?   0299

x x x x x x
x x x x x x
x x x x x x

  *a. 18
    b. 3 x 6
    c. .17

Which numeral tells the count of the following array?   0300

x x x x x x x x x x x x x x
x x x x x x x x x x x x x x

  *a. 28
    b. 26
    c. 27

Which numeral tells the count of the following array?   0301
x x x x x x x x x x x
x x x x x x x x x x x
x x x x x x x x x x x
   a. 34
   b. 35
  *c. 33

THE STUDENT WILL DEMONSTRATE HIS KNOWLEDGE THAT MANY DIFFERENT   0089
COMBINATIONS OF NUMERALS MULTIPLIED TOGETHER CAN EQUAL THE SAME
COUNT, BY SELECTING THE GROUP OF PRODUCTS THAT WOULD BE THE SAME
AS A SPECIFIED COUNT.

Choose the group of products below which is the same as the count   0302
12.

   a. 12 x 0, 7 x 2, 3 x 4
   b. 1 x 12, 4 x 3, 12 x 2
  *c. 3 x 4, 12 x 1, 6 x 2

Choose the group of products below which is the same as the count   0303
15.

   a. 15 x 0, 5 x 3, 1 x 15
  *b. 3 x 5, 15 x 1, 5 x 3
   c. 1 x 15, 3 x 6, 7 x 2

Choose the group of products below which is the same as the count   0304
24.

  *a. 12 x 2, 6 x 4, 8 x 3
   b. 24 x 1, 3 x 8, 7 x 4
   c. 6 x 4, 12 x 2, 24 x 0

Choose the group of products below which is the same as the count   0305
16.

   a. 8 x 2, 16 x 0, 4 x 4
   b. 4 x 4, 1 x 16, 6 x 10
  *c. 2 x 8, 16 x 1, 4 x 4

Choose the group of products below which is the same as the count   0306
18.

    a.   9 x 2, 3 x 6, 18 x 0
*b.   6 x 3, 18 x 1, 2 x 9
    c.   9 x 2, 6 x 4, 18 x 1

Choose the group of products below which is the same as the count   0307
30.

    a.   4 x 7, 9 x 3, 10 x 3
    b.   10 x 3, 6 x 5, 8 x 4
*c.   5 x 6, 30 x 1, 10 x 3

Choose the group of products below which is the same as the count   0308
42.

*a.   6 x 7, (3 x 2) x (7 x 1), 42 x 1
    b.   7 x 6, 6 x 7, (5 x 4) x (2 x 1)
    c.   42 x 1, (5 x 6) x (4 x 3)

Choose the group of products below which is the same as the count   0309
56.

    a.   56 x 1, (25 x 2) x (7 x 1), 7 x 8
*b.   8 x 7, (4 x 2) x (1 x 7), 56 x 1
    c.   56 x 0, 8 x 7, (2 x 4) x (7 x 1)

Choose the group of products below which is the same as the count   0310
49.

    a.   7 x 7, 49 x 0, (1 x 7) x (1 x 7)
*b.   49 x 1, (7 x 1) x (7 x 1), 7 x7
    c.   (2 x 2) x (3 x 3), 7 x7, 49 x 1

Choose the group of products below which is the same as the count   0311
48.

    a.   48 x 1, 8 x 6, (8 x 5) x (4 x 2)
    b.   48 x 0, 7 x 8, (2 x 4) x (2 x 3)
*c.   6 x 8, (3 x 2) x (4 x 2), 48 x 1

Choose the group of products below which is the same as the count   0312
20.

*a.   4 x 5, (1 x 2) x (5 x 2), (5 x 1) x (2 x 2)
    b.   10 x 2, (2 x 5) x (2 x 2), 5 x 4
    c.   (2 x 2) x (1 x 5), 4 x 5, 20 x 2

THE STUDENT WILL DEMONSTRATE HIS COMPREHENSION OF MULTIPLICATION   0090
WORD PROBLEMS BY TRANSLATING WORD PROBLEMS INTO MULTIPLICATION
EQUATIONS.

At the post office Sally bought nine 6¢ stamps. How much money   0313
did she spend?

*a.   9 x 6¢ = 54¢
    b.   6¢ x 6¢ = 36¢
    c.   6¢ x 9¢ = 56¢

Robert bought 8 stamped envelopes. They were 9¢ each. How much   0314
did he spend?

    a.   9 x 8¢ = 72¢
*b.   8 x 9¢ = 72¢
    c.   8 x 9 = 74¢

Danny went to the bakery and bought 4 cupcakes. They were 7¢ each.   0315
How much did he spend?

    a.   7¢ x 4 = 27¢
*b.   4 x 7¢ = 38¢
    c.   4 x 7 = 26

There were only 5 pieces of paper left. Mrs. Brown needed 6 times   0316
as many for her class. How many did she need?

    a.   5 x 6 = 29
    b.   6 x 4 = 30
  *c.   5 x 6 = 30

Jeffrey wanted to go on five rides at the carnival. Each ride   0317
costs 8¢. How much money did he have to bring?

  *a.   5 x 8¢ = 40
    b.   8¢ x 5 = 36¢
    c.   5 x 8¢ = 32¢

Jack is 3 times older than Ken. Ken is five years old. How old   0318
is Jack?

    a.   3 x 3 = 9
  *b.   3 x 5 = 15
    c.   5 x 3 = 16

Julia sent 7 invitations to her friends. Each stamp costs 6¢.   0319
How much did she spend for stamps?

  *a.   7 x 6¢ = 42¢
    b.   6¢ x 7 = 24¢
    c.   7 x 6¢ = 48¢

Jerry lives six times as far from Bill's house as from Joe's   0320
house. Joe lives 3 blocks from Jerry's house. How many blocks
does Bill live from Jerry?

  *a.   3 x 6 = 18 blocks
    b.   3 x 6 = 16 blocks
    c.   Can't be solved

The wrestlers are lifting weights. Greg lifted a weight 4 times
heavier than Randy. Roy lifted a weight 6 times heavier than
Randy. Randy's weight weighed 9 pounds. How many pounds did
Roy's weight weigh?

    a. 4 x 9 = 36
    b. 4 x 6 = 24
   *c. 6 x 9 = 54
    d. Can't be solved

0321

In the month of March the average temperature was twice as warm
as the coldest day in the month of January. March was three
times colder than July. The coldest day in January was 25^0. What
was the average temperature in March?

    a. Can't be solved
    b. $2 \times 3 = 6^0$
   *c. $25^0 \times 2 = 50^0$
    d. $3 \times 25^0 = 75^0$

0322

Susie's mother paid twice as much for apples on Wednesday as she
paid Saturday. Monday she paid three times more than she paid
on Saturday. She paid 6¢ a pound on Wednesday. How much did
she pay on Monday?

    a. Can't be solved
   *b. 3 x 3¢ = 9¢ a pound
    c. 2 x 6¢ = 12¢ a pound
    d. 3 x 6¢ = 18¢ a pound

0323

Judy is 3 times older than her younger brother Martin. Martin
is twice as old as his younger brother David. David is 4 years
old. How old is Judy?

   *a. 4 x 2 x 3 = 24 years old
    b. 4 x 3 x 2 = 24 years old
    c. 4 x 6 = 24 years old
    d. Can't be solved.

0324

Bill's seat is twice as far from the teacher's desk as Roger's   0325
seat. Roger's seat is 3 desks away from the teacher's desk.
How much more trouble than Roger can Bill get away with?

  * a.   2 x 3 = 6
       b.   6 = 3 x 2
       c.   2 x 1 x 3 = 6
       d.   Can't be solved.

THE STUDENT WILL APPLY HIS KNOWLEDGE OF THE PRINCIPLE OF PARTIAL   0091
PRODUCTS BY CORRECTLY IDENTIFYING THE MISSING NUMERALS AND PRODUCTS.

Circle the letter of the correct numeral and product in the   0326
following:

$$
\begin{array}{r}
8 = 5 + 3 \\
\underline{x\ 6 = x3 + 3} \\
\underline{\qquad = (\ X\ )\qquad} \\
15 = (3 \times 5) \\
9 = (3 \times 3) \\
\underline{15 = (3 \times 5)} \\
48
\end{array}
$$

    a.   15 = 3 x 5
 *b.   9 = 3 x 3
    c.   48 = 8 x 6

Circle the letter of the correct numeral and product in the   0327
following?

$$
\begin{array}{r}
8 = 6 + 2 \\
\underline{x6 = 5 + 1} \\
2\ (1 \times 2) \\
6\ (1 \times 6) \\
\bullet \\
\underline{30\ (5 \times 6)} \\
\underline{} \\
48
\end{array}
$$

    a.   2, 1
    b.   10, (1 x 10)
 *c.   10 (5 x 2)

Circle the letter of the correct numeral and product in the
following: O328

$$6 = 5 + 1$$
$$\underline{x4} = \underline{2 + 2}$$

2 (2 x 1)
10 (2 x 5)
10 (2 x 5)
    (X)
_____
24

*a. 2 (2 x 1)
 b. 2 (2 x 0)
 c. 10 (2 x 5)

Circle the letter of the correct numeral and product in the
following: O329

$$7 = 2 + 5$$
$$\underline{x6} = \underline{1 + 5}$$

2 (1 x 2)
5 (1 x 5)
  (X)
25 (5 x 5)
_____
42

 a. 10 (10 x 1)
 b. 12 (6 x 2)
*c. 10 (5 x 2

Circle the letter of the correct numeral and product in the
following: O330

$$5 = 2 + 3$$
$$\underline{x6} = \underline{4 + 2}$$

4 (2 x 2)
  (x)
_____
8 (4 x 2)
12 (4 x 3)
_____
30

 a. 6 (2 x 2)
 b. 12 (4 x 3)
*c. 6 (2 x 3)

Circle the letter of the correct numeral and product in the
following:

$$
\begin{array}{r}
5 = 3 + 2 \\
\underline{x7} = \quad 7 \\
\overline{14} \ (7 \times 2) \\
\underline{(\quad x \quad)} \\
\overline{35}
\end{array}
$$

*a. 21 (7 x 3)
 b. 21 (21 x 1)
 c. 14 (7 x 2)

Circle the letter of the correct numeral and product in the
following:

$$
\begin{array}{r}
7 = 4 + 3 \\
\underline{x7} + 2 + 5 \\
\overline{15} \ (5 \times 3) \\
20 \ (5 \times 4) \\
6 \ (2 \times 3) \\
\underline{\quad x} \\
\overline{49}
\end{array}
$$

 a. 20 (5 x 4)
 b.   6 (2 x 4)
*c.   8 (2 x 4)

Circle the letter of the correct numeral and product in the
following:

$$
\begin{array}{r}
4 = 2 + 2 \\
\underline{x7} = 4 + 3 \\
6 \ (3 \times 2) \\
\overline{8 \ (4 \times 2)} \\
\underline{8 \ (4 \times 2)} \\
\overline{8}
\end{array}
$$

 a. 12 (4 x 3)
*b.   6 (3 x 2)
 c.   6 (4 x 2)

Circle the letter of the correct numeral and product in the
following:

$$
\begin{array}{r}
6 = 2 + 4 \\
\underline{x7} \quad \underline{7} \\
\overline{14\ (7 \times 2)} \\
\overline{42}
\end{array}
$$

a. 14 (7 x 2
*b. 28 (2 x 4)
c. 28 (7 x 4)

Circle the letter of the correct numeral and product in the   0335
following:

$$
\begin{array}{r}
10 = 5 + 5 \\
\underline{x7 + 3 + 4} \\
20\ (4 \times 5) \\
20\ (4 \times 5) \\
15\ (3 \times 5) \\
\overline{70}
\end{array}
$$

*a. 15 (3 x 5)
b. 30 (5 x 3)
c. 15 (4 x 5)

Circle the letter of the correct numeral and product in the   0336
following:

$$
\begin{array}{r}
9 = 5 + 4 \\
\underline{x6 = 4 + 2} \\
8\ (2 \times 4) \\
x \\
\overline{16\ (4 \times 4)} \\
\underline{20\ (4 \times 5)} \\
54
\end{array}
$$

a. 8 (2 x 4)
b. 16 (4 x 4)
*c. 10 (2 x 5)

THE STUDENT WILL APPLY HIS KNOWLEDGE OF THE PRINCIPLE OF PARTIAL   0092
PRODUCTS BY CORRECTLY IDENTIFYING THE MISSING NUMERALS IN THE
CORRECT ORDER.

Circle the letter of the correct numerals for each of the partial   0337
products in the following problem.

$$
\begin{array}{r}
9 = 5 + 4 \\
\underline{\times 8} = \underline{6 + 2} \\
\hline
\hline
\overline{56}
\end{array}
$$

   a. 8, 20, 12, 30
*b. 8, 10, 24, 30
   c. 12, 30, 12, 20

Circle the letter of the correct numerals for each of the partial   0338
products in the following problem.

$$
\begin{array}{r}
7 = 4 + 3 \\
\underline{\times 8} = \underline{5 + 3} \\
\hline
\hline
\overline{56}
\end{array}
$$

  a. 20, 15, 12, 6
  b. 12, 9, 25, 15
*c. 9, 12, 15, 20

Circle the letter of the correct numerals for each of the partial   0339
products in the following problem.

$$
\begin{array}{r}
9 = 7 + 2 \\
\underline{\times 9} = \underline{5 + 4} \\
\hline
\overline{81}
\end{array}
$$

   a. 14, 20, 35, 10
*b. 8, 28, 10, 35
   c. 8, 35, 20, 14

Circle the letter of the correct numerals for each of the partial   0340
products in the following problem.

$$\begin{array}{r} 8 = 5 + 3 \\ \underline{x8} = \underline{7 + 1} \\ \\ \\ \hline 56 \end{array}$$

*a. 3, 5, 21, 35
 b. 15, 7, 21, 35
 c. 3, 15, 21, 35

Circle the letter of the correct numerals for each of the partial   0341
products in the following problem.

$$\begin{array}{r} 6 = 3 + 3 \\ \underline{x4} = \underline{2 + 2} \\ \\ \\ \hline 24 \end{array}$$

 a. 9, 4, 6, 6
*b. 6, 6, 6, 6
 c. 6, 9, 4, 6

Circle the letter of the correct numerals for each of the partial   0342
products in the following problem.

$$\begin{array}{r} 15 = 10 + 5 \\ \underline{x6} = \underline{3 + 3} \\ \\ \\ \hline 90 \end{array}$$

 a. 50, 9, 15, 30
 b. 15, 30, 9, 50
*c. 15, 30, 15, 30

Circle the letter of the correct numerals for each of the partial   0343
products in the following problem.

$$17 = 10 + 7$$
$$\underline{x8} = \underline{3 + 5}$$

$$\overline{136}$$

*a. 35, 50, 21, 30
 b. 70, 15, 21, 30
 c. 35, 30, 30, 21

Circle the letter of the correct numerals for each of the partial   0344
products in the following problem.

$$14 = 10 + 4$$
$$\underline{x7} = \underline{3 + 4}$$

$$\overline{98}$$

 a. 40, 12, 12, 16
 b. 16, 30, 12, 40
*c. 16, 40, 12, 30

Circle the letter of the correct numerals for each of the partial   0345
products in the following problem.

$$13 = 10 + 3$$
$$\underline{x9} = \underline{5 + 4}$$

$$\overline{117}$$

*a. 12, 40, 15, 50
 b. 30, 20, 15, 40
 c. 30, 15, 50, 20

Circle the letter of the correct numerals for each of the partial   0346
products in the following problem.

$$19 = 10 + 9$$
$$\underline{x9} \quad \underline{6 = 3}$$

 a. 27, 60, 30, 55
*b. 27, 30, 54, 60
 c. 27, 30, 60, 56

Circle the letter of the correct numerals for each of the partial   0347
products in the following problem.

$$12 = 10 + 2$$
$$\underline{x7} = \underline{6 + 1}$$

$$\overline{84}$$

 a. 20, 6, 2, 60
*b. 2, 10, 12, 60
 c. 2, 20, 60, 12

Circle the letter of the correct numerals for each of the partial   0348
products in the following problem.

$$19 = 10 + 9$$
$$\underline{x9} = \underline{5 + 4}$$

$$\overline{171}$$

 a. 90, 20, 45, 40
 b. 40, 45, 50, 35
*c. 36, 40, 45, 50

Circle the letter of the correct numerals for each of the partial products in the following problem.   0349

$$
\begin{array}{r}
9 = 3 + 3 + 3 \\
\underline{x8} = \underline{\quad 2 + 6} \\
\underline{} \\
\underline{} \\
\underline{} \\
\underline{} \\
\underline{} \\
\underline{} \\
\underline{\quad\quad 72}
\end{array}
$$

*a. 18, 18, 18, 12, 12, 12
 b. 9, 9, 9, 12, 12, 18
 c. 18, 18, 12, 12

Circle the letter of the correct numerals for each of the partial products in the following problem.   0350

$$
\begin{array}{r}
9 = 3 + 3 + 3 \\
\underline{x9} = \underline{\quad x\ 9} \\
\underline{} \\
\underline{} \\
\underline{\quad\quad 81}
\end{array}
$$

 a. 9, 27, 9
 b. 9, 9, 9, 27, 27, 27
*c. 27, 27, 27

Circle the letter of the correct numerals for each of the partial products in the following problem.   0351

$$
\begin{array}{r}
10 = 3 + 3 + 4 \\
\underline{x9} = \underline{3 + 3 + 3}
\end{array}
$$

 a. 9, 12, 9, 12, 9, 12, 9, 12, 9
 b. 12, 9, 9, 12, 12, 9, 9, 9, 9, 12
*c. 12, 9, 9, 12, 9, 9, 12, 9, 9

Circle the letter of the correct numerals for each of the partial   0352
products in the following problem.

$$10 = 4 + 4 + 2$$
$$\underline{x9} = \underline{6 + 2 \div 1}$$

```
 ——
 ——
 ——
 ——
 ——
 ——
 ——
 ——
 ——
——————
       90
```

a. 4, 4, 8, 2, 12, 24, 8, 6, 10
*b. 2, 4, 4, 4, 8, 8, 12, 24, 24
 c. 2, 4, 8, 12, 24, 2, 4, 10, 24

Circle the letter of the correct numerals for each of the partial   0353
products in the following problem.

$$9 = 6 + 2 + 1$$
$$\underline{x9} = \underline{3 + 4 + 2}$$

```
 ——
 ——
 ——
 ——
 ——
 ——
 ——
 ——
 ——
——————
       81
```

*a. 2, 4, 12, 4, 8, 24, 3, 6, 18
 b. 2, 4, 12, 3, 6, 18, 4, 24, 8
 c. 18, 12, 6, 12, 6, 18, 6, 2, 4

THE STUDENT WILL ANALYZE A LONG MULTIPLICATION PROBLEM BY FINDING THE ERROR IN THE GIVEN PARTIAL PRODUCTS. 0093

Which of the following partial products is wrong in this long multiplication problem? 0354

```
    a.  64                           28
    b.  160                         x68
    c.  480                          64
   *d.  7200                        160
                                    480
                                   7200
                                   7904
```

Which of the following partial products is wrong in this long multiplication problem? 0355

```
    a.  2                            51
   *b.  50                          x62
    c.  60                            2
    d.  3000                         50
                                     60
                                   3000
                                   3112
```

Which of the following partial products is wrong in this long multiplication problem? 0356

```
    a.  16                           28
    b.  40                          x72
   *c.  5600                         16
    d.  1400                         40
                                   5600
                                   1400
                                   7056
```

Which of the following partial products is wrong in this long multiplication problem?   0357

   a. 9

   b. 360

   c. 50

*d. 200

$$\begin{array}{r} 41 \\ \underline{\times 59} \\ 9 \\ 360 \\ 50 \\ \underline{200} \\ 609 \end{array}$$

Which of the following partial products is wrong in this long multiplication problem?   0358

   a. 35

   b. 350

   c. 350

*d. 350

$$\begin{array}{r} 77 \\ \underline{\times 55} \\ 35 \\ 350 \\ 350 \\ \underline{350} \\ 1085 \end{array}$$

Which of the following partial products is wrong in this long multiplication problem?   0359

   a. 24

   b. 120

*c. 1200

   d. 600

$$\begin{array}{r} 36 \\ \underline{\times 24} \\ 24 \\ 120 \\ 1200 \\ \underline{600} \\ 1944 \end{array}$$

Which of the following partial products is wrong in this long multiplication problem?   0360

   a. 12

   b. 240

   c. 320

*d. 640

$$\begin{array}{r} 84 \\ \underline{\times 83} \\ 12 \\ 240 \\ 320 \\ \underline{640} \\ 1212 \end{array}$$

Which of the following partial products is wrong in this long
multiplication problem?

0361

```
*a.   40
 b.   130
 c.   160
 d.   7200
```
```
        92
       x82
        40
       180
       160
      7200
      7500
```

Which of the following partial products is wrong in this long
multiplication problem?

0362

```
 a.   24
*b.   64
 c.   180
 d.   4800
```
```
        83
       x68
        24
        64
       180
      4800
      5068
```

Which of the following partial products is wrong in this long
multiplication problem?

0363

```
*a.   20
 b.   450
 c.   240
 d.   3000
```
```
        54
       x69
        20
       450
       240
      3000
      3710
```

Which of the following partial products is wrong in this long
multiplication problem?

0364

```
 a.   36
 b.   450
*c.   2400
 d.   3000
```
```
        54
       x69
        36
       450
      2400
      3000
      5896
```

Which of the following partial products is wrong in the long   0365
multiplication problem?

  a. 36   46
*b. 240   x76
  c. 420   36
  d. 2800   240
                                 420
                               2800
                               4496

Which of the following partial products is wrong in this long   0366
multiplication problem?

  a. 21   97
  b. 270   x53
*c. 3500   21
  d. 4500   270
                             3500
                             4500
                             8291

Which of the following partial products is wrong in this long   0367
multiplication problem?

  a. 48   36
  b. 240   x48
  c. 240   48
*d. 320   240
                             240
                             320
                             848

Which of the following partial products is wrong in this long   0368
multiplication problem?

  a. 6   73
*b. 14   x62
  c. 1800   6
  d. 4200   14
                             180
                             4200
                             4400

Which of the following partial products is wrong in this long multiplication problem?   0373

```
a.   9                                    53
b.   150                                 x63
c.   180                                ____
*d.  300                                   9
                                         150
                                         180
                                         300
                                        ____
                                         639
```

Which of the following partial products is wrong in this long multiplication problem?   0374

```
a.   8                                    121
b.   160                                  x98
c.   800                                 ____
*d.  900                                    8
                                          160
                                          800
                                          900
                                         1800
                                         9000
                                        _____
                                        12668
```

Which of the following partial products is wrong in this long multiplication problem?   0375

```
*a.  360                                   412
b.   60                                    x39
c.   300                                  ____
d.   12000                                  18
                                            90
                                           360
                                            60
                                           300
                                         12000
                                        _____
                                         12828
```

Which of the following partial products is wrong in this long   0376
multiplication problem?

  a. 160   825
*b. 640   x48
  c. 800   40
  d. 32000   160
                                         640
                                       200
                                     800
                                  32000
                                  33840

Which of the following partial products is wrong in this long   0377
multiplication problem?

  a. 3200   496
  b. 420   x78
  c. 6300   48
*d. 2800   720
                                   3200
                                   420
                                  6300
                                  2800
                                13488

Which of the following partial products is wrong in this long   0378
multiplication problem?

  a. 3200   496
  b. 420   x78
*c. 630   48
  d. 28000   720
                                   3200
                                   420
                                   630
                                  28000
                                33018

Which of the following partial products is wrong in this long multiplication problem?　　　　0379

```
a.  1800                    378
*b. 2400                    x36
c.  2100                   ·48
d.  9000                   420
                          1800
                          2400
                          2100
                          9000
                         15768
```

Which of the following partial products is wrong in this long multiplication problem?　　　　0380

```
*a.  640                    814
b.   80                     x28
c.   200                    32
d.   16000                  80
                           640
                           80
                           200
                          16000
                          17032
```

Which of the following partial products is wrong in this long multiplication problem?　　　　0381

```
a.  70                      612
b.  4200                    x47
*c. 800                     14
d.  24000                   70
                          4200
                           800
                           400
                         24000
                         29484
```

Which of the following partial products is wrong in this long multiplication problem?　　　　0382

```
*a. 45                      749
b.  2000                    x56
c.  35000                   54
d.  240                    240
                          4200 .
                            45
                          2000
                         35000
                         41539
```

Which of the following partial products is wrong in this long
multiplication problem?   0383

<pre>
    a.   900   971
    b.   70   x71
   *c.   490   1
    d.   63000   70
                                     900
                                      70
                                     490
                                   63000
                                   64531
</pre>

Which of the following partial products is wrong in this long   0384
multiplication problem?

<pre>
    a.   3500   518
   *b.   2400   x37
    c.   300   56
    d.   15000   70
                                    3500
                                    2400
                                     300
                                   15000
                                   21326
</pre>

Which of the following partial products is wrong in this long   0385
multiplication problem?

<pre>
   *a.   50   148
    b.   160   x25
    c.   800   40
    d.   2000   200
                                      50
                                     160
                                     800
                                    2000
                                    3250
</pre>

Which of the following partial products is wrong in this long   0386
multiplication problem?

a.   320   614
*b. 8000   x282
c.   48000   8
d.   800   20
                                                 1200
                                                  320
                                                 8000
                                                48000
                                                  800
                                                 2000
                                                120000
                                                180348

Which of the following partial products is wrong in this long   0387
multiplication problem?

a.   3600   897
b.   32000   x647
*c. 42000   49
d.   54000   630
                                                 5600
                                                  280
                                                 3600
                                                32000
                                                42000
                                                54000
                                                480000
                                                618159

Which of the following partial products is wrong in this long   0388
multiplication problem?

a.   1000   354
*b. 60000   x427
c.   1600   28
d.   20000   350
                                                 2100
                                                   80
                                                 1000
                                                60000
                                                 1600
                                                20000
                                                120000
                                                205158

Which of the following partial products is wrong in this long   0389
multiplication problem?

  a. 20000   488
  b. 3200   x457
  c. 32000   56
*d. 16000   560
                              2800
                              400
                             4000
                             20000
                             3200
                            32000
                            16000
                            79016

Which of the following partial products is wrong in this long   0390
multiplication problem?

  a. 56000   721
*b. 400   x389
  c. 6000   9
  d. 210000   180
                              6300
                              80
                             1600
                             56000
                             400
                             6000
                            210000
                            280469

Which of the following partial products is wrong in this long   0391
multiplication problem?

*a. 2800   457
  b. 4200   x675
  c. 30000   35
  d. 240000   250
                              2000
                             490
                             3500
                             2800
                             4200
                             30000
                            240000
                            283175

Which of the following partial products is wrong in this long multiplication problem?   0392

```
a.  3000                    317
b.  1400                   x218
c.  2000                     56
*d.  6000                    80
                           2400
                             70
                            100
                           3000
                           1400
                           2000
                           6000
                          15106
```

Which of the following partial products is wrong in this long multiplication problem?   0393

```
*a.  20000                  226
 b.  1200                  x214
 c.  4000                    24
 d.  40000                   80
                            800
                             60
                            200
                          20000
                           1200
                           4000
                          40000
                          66364
```

GIVEN THE COUNT AND ONE FACTOR, THE STUDENT WILL DEMONSTRATE HIS   0094
KNOWLEDGE OF THE BASIC MULTIPLICATION FACTS BY IDENTIFYING THE
MISSING FACTOR FROM A LIST.

Directions: Select the correct answer.

_____ x 6 = 24   0394

```
*a.  4
 b.  3
 c.  7
 d.  2
```

_____ x 4 = 36   0395

   a. 7
   *b. 9
   c. 8
   d. 4

___6___ x _____ = 42   0396

   a. 8
   b. 6
   c. 9
   *d. 7

8 x _____ = 81   0397

   a. 6
   *b. 9
   c. 7
   d. 8

3 x _____ = 27   0398

   a. 7
   b. 6
   c. 8
   *d. 9

28 = 4 x _____   0399

   a. 9
   *b. 7
   c. 6
   d. 8

30 = 5 x _____   0400

   a. 3
   b. 5
   *c. 6
   d. 9

24 = 3 x _____   0401

    *a. 8
    b. 6
    c. 4
    d. 7

_____ x 9 = 36   0402

    a. 7
    b. 6
    c. 3
    *d. 4

6 x _____ = 60   0403

    a. 1
    b. 0
    *c. 10
    d. 5

8 x _____ = 64   0404

    a. 2
    b. 7
    *c. 8
    d. 9

7 x _____ = 35   0405

    a. 3
    b. 7
    *c. 5
    d. 6

_____ x 4 = 28

    a. 6
  *b. 7
    c. 9
    d. 8

_____ x 5 = 20

    a. 6
    b. 3
  *c. 4
    d. 5

18 = 3 x _____

    a. 4
  *b. 6
    c. 5
    d. 8

18 = 9 x _____

  *a. 2
    b. 3
    c. 4
    d. 5

8 x _____ = 32

  *a. 4
    b. 7
    c. 6
    d. 3

3 x _____ = 6

    a. 1
    b. 4
  *c. 2
    d. 3

9 = 3 x _____   0412

    a. 9
    b. 0
    c. 1
   *d. 3

3 x _____ = 15   0413

    a. 4
  *b. 5
    c. 6
    d. 3

12 = 3 x _____   0414

    a. 2
    b. 3
    c. 6
  *d. 4

21 = 7 x _____   0415

    a. 6
    b. 2
  *c. 3
    d. 4

4 x _____ = 16   0416

    a. 2
    b. 3
  *c. 4
    d. 5

36 = _____ x 4   0417

  *a. 9
    b. 8
    c. 6
    d. 4

0418

70 = 10 x _____

    *a. 7
    b. 6
    c. 10
    d. 1

0419

25 = 5 x _____

    a. 4
    *b. 5
    c. 7
    d. 6

0420

6 x _____ = 30

    a. 4
    b. 3
    *c. 5
    d. 6

0421

6 x _____ = 36

    a. 2
    b. 4
    *c. 6
    d. 8

0422

7 x _____ = 28

    *a. 4
    b. 2
    c. 6
    d. 3

0423

7 x _____ = 49

    a. 6
    *b. 7
    c. 8
    d. 9

_____ x 8 = 64   0424

    a. 7
    b. 2
    c. 6
  *d. 8

72 = 9 x _____   0425

    a. 6
    b. 2
    c. 7
  *d. 8

81 = _____ x 9   0426

    a. 7
  *b. 9
    c. 5
    d. 6

63 = _____ x 9   0427

  *a. 7
    b. 3
    c. 5
    d. 6

6 x _____ = 36   0428

    a. 2
    b. 4
  *c. 6
    d. 8

100 = 10 x _____   0429

    a. 0
  *b. 10
    c. 1
    d. 100

_____ x 9 = 27   0430

    a. 6
    b. 4
    c. 2
 *d. 3

25 = _____ x 5   0431

    a. 4.
    b. 6
 *c. 5
    d. 7

THE STUDENT WILL ANALYZE A GIVEN PROBLEM OF COMBINED COMPUTATIONAL   0095
STEPS OF LONG MULTIPLICATION BY CHOOSING THE CORRECT COMBINATION
OF PARTIAL PRODUCTS.

$$\begin{array}{r} 21 \\ \times 34 \\ \hline 4 \\ \\ 110 \\ 600 \\ \hline 714 \end{array}$$

In the above problem what combination of partial products was used   0432
to get 4 ones?

 *a. 1 ones x 4 ones = 4 ones
  b. 2 ones x 2 ones = 4 ones
  c. 4 ones x 2 ones = 4 ones

In the above problem what combination of partial products was used   0433
to get 11 tens?

  a. 2 tens x 4 tens = 11 tens
  b. 3 tens + 4 tens + 4 tens = 11 tens
 *c. 8 tens + 3 tens = 11 tens

In the above problem what combination of partial products was used to get 6 hundreds?   0434

    a. 30 ones x 20 tens = 6 hundreds
  *b. 3 tens x 2 tens = 6 hundreds
    c. 3 tens x 2 ones = 6 hundreds

```
   95
  x52
   10
  /.30
  4500
  4940
```

In the above problem what combination of partial products was used to get 10 ones?   0435

  *a. 2 ones x 5 ones = 10 ones
    b. 2 tens x 5 tens = 10 ones
    c. 2 ones x 5 tens = 10 ones

In the above problem what combination of partial products was used to get 43 tens?   0436

    a. (2 tens x 9 ones) + (5 ones x 5 tens) = 43 tens
    b. (5 ones x 5 ones) + (9 tens x 2 ones) = 43 tens
  *c. (9 tens x 2 ones) + (5 tens x 5 ones) = 43 tens

In the above problem what combination of partial products was used to get 43 tens?   0437

    a. 18 ones + 25 ones = 43 tens
    b. 25 ones + 18 tens = 43 tens
  *c. 18 tens + 25 tens = 43 tens

In the above problem what combination of partial products was used to get 45 hundreds?   0438

    a. 9 tens x 5 ones = 45 hundreds
  *b. 90 tens x 5 tens = 45 hundreds
    c. 90 ones x 50 tens = 45 hundreds

```
    59
   x32
    18
   370
  1500
  18888
```

In the above problem what combination of partial products was used   0439
to get 18 ones?

    a. 9 tens x 2 ones = 18 ones
 *b. 9 ones x 2 ones = 18 ones
    c. 2 ones x 9 tens = 18 ones

In the above problem what combination of partial products was used   0440
to get 37 tens?

    a. (5 tens x 2 ones) x (3 tens x 9 ones)
    b. (3 tens x 9 ones) x (2 ones x 9 ones)
 *c. (2 ones x 5 tens) + (3 tens x 9 ones)

In the above problem what combination of partial products was used   0441
to get 37 tens?

 *a. 10 tens + 27 tens = 37 tens
    b. 10 ones + 27 tens = 37 tens
    c. 10 tens + 27 ones = 37 tens

In the above problem what combination of partial products was used   0442
to get 15 hundreds?

    a. 50 ones x 30 tens = 15 hundreds
    b. 3 ones x 5 ones = 15 hundreds
 *c. 5 tens x 3 tens = 15 hundreds

$$\begin{array}{r} 28 \\ \times 61 \\ \hline 8 \\ 500 \\ 1200 \\ \hline 1708 \end{array}$$

In the above problem what combination of partial products was used   0443
to get 8?

    a. 1 one x 8 tens = 8 ones
    b. 1 one + 8 ones = 8 tens
*c. 1 one x 8 ones = 8 ones

In the above problem what combination of partial products was used   0444
to get 500?

    a. (1 one x 2 tens) x (6 tens x 8 ones) = 50 tens
*b. (8 ones x 6 tens) + (1 one x 2 tens) = 500 ones
    c. (1 one x 2 tens) + (6 ones x 8 tens) = 50 tens

In the above problem what combination of partial products was used   0445
to get 500?

    a. 48 tens x 2 tens = 50 tens
*b. 2 tens + 48 tens = 500 ones
    c. 48 ones + 2 ones = 50 tens

In the above problem what combination of partial products was used   0446
to get 1200?

*a. 2 tens x 6 tens = 120 tens
    b. 6 tens x 2 tens = 120 hundreds
    c. 2 hundreds x 6 tens = 1200 ones

```
  32
 x54
1728
```

In the above problem what combination of partial products was used   0447
to get 8?

  *a. 2 ones x 4 ones = 8 ones
    b. 4 ones x 2 tens = 8 ones
    c. 4 tens x 2 ones = 8 ones

In the above problem what combination of partial products was used   0448
to get 2 tens?

    a. (3 tens x 4 tens) + (5 tens x 2 tens) = 22 tens (Write
        2 tens, remember 2)
    b. (4 ones x 3 tens) x (5 tens + 2 tens) = 22 tens (Write
        2 tens, remember 200)
 *c. (4 ones x 3 tens) + (5 tens x 2 ones) = 22 tens (Write
        2 tens, remember 20)

In the above problem what combination of partial products was used   0449
to get 17 hundreds?

  *a. 2 hundreds + (3 tens x 5 tens) = 17 hundreds
    b. 15 hundreds x 2 hundreds = 17 hundreds
    c. (3 hundreds x 5 hundreds + 2 hundreds = 17 hundreds

```
  24
 x51
1224
```

In the above problem what combination of partial products was used to   0450
get 4?

    a. 4 tens x 1 ten = 4 ones
  *b. 1 one x 4 ones = 4 ones
    c. 4 ones x 1 ten = 4 tens

In the above problem what combination of partial products was used   0451
to get 2 tens?

    a. (1 ten x 2 tens) + (5 tens x 4 tens) = 22 hundreds (Write
        2 tens, remember 2)
 *b. (1 one x 2 tens) + (5tens x 4 ones) = 22 tens (Write
        2 tens, remember 200)
    c. (1 one x 2 tens) + (5 tens x 4 ones) = 22 ones (Write
        2 ones, remember 20)

In the above problem what combination of partial products was used   0452
to get 1200?

    a. (5 tens x 2 tens) + 20 hundreds = 12 tens
    b. (20 tens + (5 tens x 2 tens) = 120 hundreds
 *c. 200 ones + (2 tens x 5 tens) = 1200 ones

$$\begin{array}{r} 24 \\ \times 68 \\ \hline 1632 \end{array}$$

In the above problem what combination of partial products was used   0453
to get 2?

    a. 8 ones x 4 ones = 32 tens (Write 2 ones, remember 30)
    b. 4 ones x 8 ones = 32 ones (Write 2 tens, remember 30)
 *c. 4 ones x 8 ones = 32 ones (Write 2 ones, remember 3 tens)

In the above problem what combination of partial products was used   0454
to get 3 tens?

    a. (4 ones x 6 tens) + 3 tens + (8 tens x 2 tens)= 430 ones
 *b. 3 tens + (8 ones x 2 tens) + (6 tens x 4 ones) + 43 tens
    c. (8 ones x 4 ones) + (2 tens x 6 tens) + 3 tens = 43 tens

In the above problem what combination of partial products was used   0455
to get 1600?

 *a. (2 tens x 6 tens) + 400 = 1600
    b. (2 x 6 + 4 = 16 tens
    c. (20 x 60) + 40 = 16 hundreds

```
  43
  x6
 258
```

In the above problem what combination of partial products was used   O456
to get 8?

   a. 3 ones x 6 ones = 18 tens (Write 8, remember 1 ten)
*b. 3 ones x 6 ones = 18 ones (Write 8, remember 1 ten)
   c. 3 tens x 6 tens = 18 tens (Write 8, remember 1 ten)

In the above problem what combination of partial products was used   O457
to get 25 tens?

   a. 1 ten + (4 tens x 6 tens) = 25 tens
*b. (4 tens x 6 ones) + 1 ten = 25 tens
   c. (6 ones x 4 ones) + 1 ten = 25 tens

```
  72
 x 4
 288
```

In the above problem, what combination of partial products was used   O458
to get 8 ones?

   a. 4 tens x 2 ones = 8 ones
   b. 4 ones x 2 tens = 8 ones
*c. 2 ones x 4 ones = 8 ones

In the above problem, what combination of partial products was used   O459
to get 28 tens?

*a. 7 tens x 4 ones = 28 tens
   b. 4 tens x 7 tens = 28 tens
   c. 7 tens x 4 tens = 28 tens

$$\begin{array}{r} 615 \\ \times\ 8 \\ \hline 4920 \end{array}$$

In the above problem what combination of partial products was used   0460
to get 0 ones?

    a.   5 ones x 8 tens = 40 ones (Write 0, remember 4 tens)
    b.   8 ones x 5 tens = 40 ones (Write 0, remember 4 tens)
   *c.   8 ones x 5 ones = 40 ones (Write 0, remember 4 tens)

In the above problem what combination of partial products was used   0461
to get 2 tens?

   *a.   (8 ones x 1 ten) + 4 tens = 12 tens (Write 2, remember 100)
    b.   (8 tens x 1 one) + 4 tens = 12 tens (Write 2, remember 100)
    c.   (8 x 1) + 4 tens = 12 tens   (Write 2, remember 100)

In the above problem what combination of partial products was used   0462
to get 49 hundreds?

    a.   (6 tens x 8 ones) + 1 hundred = 4900
   *b.   (6 hundress x 8 ones) + 100 = 49 hundreds
    c.   (6 hundreds x 8 tens) + 100 = 49 hundreds

$$\begin{array}{r} 215 \\ \times\ 6 \\ \hline 1290 \end{array}$$

In the above problem what combination of partial products was used   0463
to get 0 ones?

   *a.   5 ones x 6 ones = 30 ones (Write 0, remember 3 tens)
    b.   6 ones x 5 tens = 30 ones (Write 0, remember 3 tens)
    c.   5 ones x 6 ones = 30 ones (Write 0, remember 3 ones)

In the above problem what combination of partial products was used   0464
to get 9 tens?

    a. (1 one x 6 ones) + 3 tens = 9 tens
    b. (1 ten x 6 ones) + 2 tens = 9 tens
  *c. (1 ten x 6 ones) + 3 tens = 9 tens

In the above problem what combination of partial products was used   0465
to get 12 hundreds?

  *a. 2 hundreds x 6 ones = 1200
    b. 2 x 6 = 12 hundreds
    c. 2 hundreds x 6 tens = 12 hundreds

$$
\begin{array}{r}
39 \\
\times 68 \\
\hline
312 \\
2340 \\
\hline
2652
\end{array}
$$

In the above problem what combination of partial products was used   0466
to get 312?

  *a. (9 x 8) + (30 x 8) = 312
    b. (9 ones x 8 ones) + (3 tens x 8 tens) = 312
    c. (9 x 8) + (30 x 8) + 70 = 312

In the above problem what combination of partial products was used   0467
to get 2340?

    a. (90 x 60) + (30 x 60) = 2340
  *b. (9 ones x 6 tens) + (3 tens x 6 tens) = 2340
    c. (9 x 60) + (3 ones x 6 tens) = 2340

In the above problem what combination of partial products was used   0468
to get 2300?

    a. (3 tens x 6 tens) + 5 tens = 2300
  *b. (3 tens x 6 tens + 500 = 2300
    c. (30 x 60) + 50 = 2300

$$\begin{array}{r} 78 \\ \times 32 \\ \hline 156 \\ 2340 \\ \hline 2496 \end{array}$$

In the above problem what combination of partial products was used   O469
to get 156?

    a. (8 ones x 2 ones) + (70 tens x 2 ones) = 156 hundreds
    b. (8 ones x 2) + (70 x 2 ones) = 156 tens
  *c. (8 x 2) + (70 x 2) = 156 ones

In the above problem what combination of partial products was used   O470
to get 2340?

    a. (30 x 80) + (30 x 70) = 2340
  *b. (3 tens x 8 ones) + (3 tens x 7 tens) = 2340 tens
    c. (30 x 8) + (30 x 70) = 2340 thousands

$$\begin{array}{r} 324 \\ \times 23 \\ \hline 972 \\ 6480 \\ \hline 7452 \end{array}$$

In the above problem, what combination of partial products was used   O471
to get 972?

    a. (4 ones x 3 ones) + (20 tens x 3 ones) + 300 hundreds x 3)
       = 972
    b. (4 x 3) + (2 x 3) + (300 x 3) = 972
  *c. (4 x 3) + (20 x 3) + (300 x 3) = 972

In the above problem what combination of partial products was used   O472
to get 6480?

  *a. (2 tens x 4 ones) + (2 tens x 2 tens) + (3 hundreds x 2 tens)
      = 6480
    b. (20 x 4) + (200 x 20) + (300 x 20) = 6480
    c. (20 tens x 4 ones) + (20 tens x 20) + (300 x 2 tens) = 6480

```
   123
  x321
   123
  2360
 36900
 39483
```

In the above problem what combination of partial products was used   0473
to get 123?

 *a. (1 x 3) + (1 x 20) + (1 x 100) = 123
  b. (1 x 3 ones) + (1 x 2 ones) + (1 x 1 one) = 123
  c. (1 one x 3 ones) + (1 one x 2 tens) + (1 one x 1 ten) = 123

In the above problem what combination of partial products was used   0474
to get 2450?

 *a. (20 x 3) + (20 x 20) + (20 x 100) = 2460
  b. (20 x 3) + (200 x 20) + 100 x 20) = 2460
  c. (20 ones x 3) + (20 ones x 200) + (2 tens x 100) = 2460

In the above problem what combination of partial products was used   0475
to get 36900?

  a. (3 hundreds x 3) + (300 x 200) + (300 x 100) = 36900
  b. (300 x 3) + (300 x 20) + (300 x 1 hundred) = 359 tens
 *c. (300 x 3 ones) + (300 x 2 tens) + (300 x 100) = 36900

```
   616
  x324
  2464
 12320
184800
199584
```

In the above problem what combination of partial products was used   0476
to get 2464?

  a. (6 ones x 4) + (10 tens x 4) + (600 x 4) = 2464
 *b. (6 x 4) + (10 x 4) + (600 x 4) = 2464
  c. (6 ones x 4 ones) + (10 ones x 4 ones) + 60 ones x 4 ones)
      = 2464

In the above problem what combination of partial products was used   0477
to get 12320?

   *a. (20 x 6 ones) + 20 x 1 ten) + (20 x 6 hundreds) = 1232 tens
    b. (2 tens x 6) + (2 tens x 1) + (2 tens x 6) = 12320
    c. (20 x 6) + 20 x 10) + 20 x 60) = 1232 hundreds

In the above problem what combination of partial products was used   0478
to get 184800?

    a. (6 x 3 hundreds) + (1 x 3 hundreds) + 6 x 3 hundreds = 184800
    b. (300 x 6) + (300 x 10) + 300 x 600 = 1848 thousands
   *c. (300 x 6) + (300 x 10) + (300 x 600) = 184800

MULTIPLICATION AND DIVISION

THE STUDENT DEMONSTRATES UNDERSTANDING OF THE RELATION BETWEEN   0029
MULTIPLICATION AND DIVISION BY RECOGNIZING RELATED MULTIPLICATION
AND DIVISION COMBINATIONS.

Here are three equations.

$$3 \times 5 = 15$$
$$15 \div 5 = 3$$
$$15 \div 3 = 5$$

Which of the following is related to the above equations?   0479

  a. $5 \times 1 = 5$
  b. $5 \times 2 = 10$
*c. $5 \times 3 = 15$
  d. $12 \div 4 = 3$

Here are three more equations.

$$3 \times 4 = 12$$
$$4 \times 3 = 12$$
$$12 \div 4 = 3$$

Which of the following is related to the above three equations?   0480

  a. $12 \div 2 = 6$
*b. $12 \div 3 = 4$
  c. $6 \times 2 = 12$
  d. $12 \div 6 = 2$

Do these the same way.

$$1 \times 4 = 4$$
$$4 \times 1 = 4$$
$$4 \div 1 = 4$$

Which of the following is related to the above three equations?   0481

  a. $2 \times 2 = 4$
  b. $4 \div 2 = 2$
  c. $8 \div 4 = 2$
*d. $4 \div 4 = 1$

THE CHILD WILL APPLY HIS KNOWLEDGE THAT MULTIPLICATION MAKES AN ANSWER HAVE A HIGHER NUMBER AND WHOLE NUMBER DIVISION MAKES AN ANSWER HAVE A LOWER NUMBER, BY BEING ABLE TO SELECT EITHER THE MULTIPLICATION OR DIVISION SIGNS WHICH WOULD BELONG IN A SPECIFIED PROBLEM.   0077

In which group of problems below would you use a multiplication   0482
sign in each problem. Circle the correct answer.

    a.   15 $\bigcirc$ 5 = 3   *b. 5 $\bigcirc$ 3 = 15   c.   45 $\bigcirc$ 5 = 9
          25 $\bigcirc$ 5 = 5   5 $\bigotimes$ 5 = 25   35 $\bigcirc$ 7 = 5
          30 $\bigcirc$ 5 = 10   5 $\bigcirc$ 10 = 50   4 $\bigcirc$ 4 = 16

In which group of problems below would you use a division sign in   0483
each problem? Circle the correct answer.

  *a.   45 $\bigcirc$ 5 = 7   b. 1 $\bigcirc$ 2 = 2   c.   7 $\bigcirc$ 1 = 7
         30 $\bigcirc$ 5 = 6   3 $\bigcirc$ 3 = 9   15 $\bigcirc$ 3 = 5
         16 $\bigcirc$ 4 = 4   3 $\bigcirc$ 2 = 6   14 $\bigcirc$ 2 = 7

MEASUREMENT

LENGTH

THE STUDENT DEMONSTRATES AN UNDERSTANDING OF LENGTH BY IDENTIFYING   0009
THE RELATION BETWEEN THE INCH, FOOT AND YARD AS UNITS OF LINEAR
MEASURE.

Mark the greater length.   0484

    a. 10 inches more than 1 foot
  · b. 18 inches and 5 inches
  *c. 6 inches less than 1 yard
    d. 2 feet
    e. 28 inches

Mark the lesser length.   9485

    a. 2 feet and 8 inches
    b. 10 inches and 20 inches
    c. 3 feet
    d. 1 yard less 5 inches
  *e. 29 inches

GIVEN A GROUP OF THREE STICKS AT ONE TIME, NO TWO OF WHICH ARE THE   0050
SAME LENGTH, THE CHILD WILL SHOW HIS UNDERSTANDING OF THE MEANING
OF "LONGEST" AND "SHORTEST" BY CHOOSING FROM THE GROUP OF STICKS
AT THE DIRECTION OF THE TEACHER.

Directions: The teacher will cut sticks from wooden dowels into
               2 in., 4 in., 6 in., 8 in., and 10 in. lengths. She
               will place three of them before the child at one
               time and ask him to choose.

The teacher puts out the 2 in., 4 in., and 8 in. sticks and says,   0486
"Pick up the longest stick."

    a. child picks up 2 in. stick
    b. child picks up 4 in. stick
  *c. child picks up 8 in. stick
    d. child picks up no stick

Teacher sets out 2 in., 6 in., and 8 in. sticks and says, "Pick   0487
up the shortest stick."

   *a.   child picks up 2 in. stick
    b.   child picks up 6 in. stick
    c.   child picks up 8 in. stick
    d.   child picks up no stick

Teacher puts out 2 in., 8 in., and 10 in. sticks and says, "Choose   0488
the longest stick."

    a.   child picks up 2 in. stick
    b.   child picks up 8 in. stick
   *c.   child picks up 10 in. stick
    d.   child picks up no stick

Teacher sets out 2 in., 4 in., and 8 in. sticks and asks, "Pick up   0489
the shortest stick."

   *a.   child picks up 2 in. stick
    b.   child picks up 4 in. stick
    c.   child picks up 8 in. stick
    d.   child picks up no stick

Teacher sets out 4 in., 6 in., and 8 in. sticks and says, "Choose   0490
the shortest stick."

   *a.   child picks up 4 in. stick
    b.   child picks up 6 in. stick
    c.   picks up 8 in. stick
    d.   picks up no stick

Teacher puts out 6 in., 8 in., and 10 in. sticks and says, "Choose   0491
the longest stick."

   *a.   Child picks up 10 in. stick
    b.   Child picks up 8 in. stick
    c.   Child picks up 6 in. stick
    d.   Child picks up no stick

THE CHILD WILL DEMONSTRATE HIS UNDERSTANDING OF THE RELATIONSHIP   0074
BETWEEN THE INCH, FOOT, AND YARD, BY BEING ABLE TO SELECT THE
UNIT OF MEASUREMENT THAT MEASURES THE SAME AMOUNT AS A SPECIFIED
AMOUNT.

Circle the amount below which m 1 yard   0492

   a. 2 feet
   b. 12 inches
 *c. 36 inches
   d. 1½ feet

Circle the amount below which m 1 foot   0493

*a. 12 inches
 b. 6 inches
 c. 1 yard
 d. 2 yards

48 inches m _____?   0494

  a. 1 yard
*b. 1 yard and 1 foot
  c. 2 yards and 2 feet

72 inches m _____?   0495

*a. 2 yards
 b. 4 feet
 c. 1 yard and 2 feet

13 inches m _____?   0496

*a. 1 foot 1 inch
 b. 2 feet
 c. 1 yard

THE CHILD WILL DEMONSTRATE HIS ABILITY TO ADD AND SUBTRACT DIS-
TANCES BETWEEN GIVEN POINTS ON A MAP BY BEING ABLE TO COMPUTE
DISTANCES TRAVELED WHEN THE PATH TAKEN IS SPECIFIED.

0076
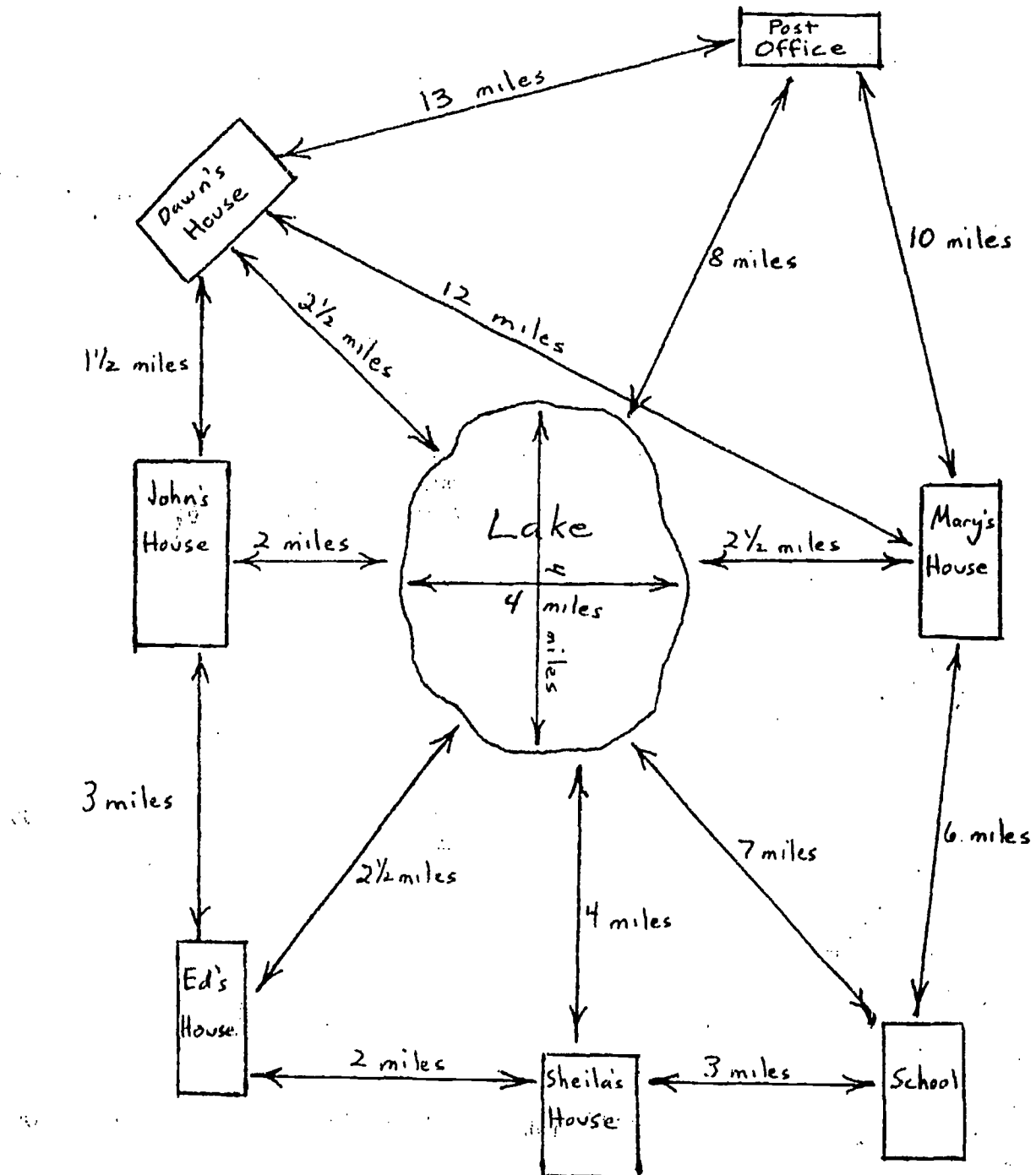
On the map the shortest way of getting from Mary's house to John's   0497
house is _____ miles. Circle the correct distance below.

    *a. 8½ miles
    b. 4½ miles
    c. 10 miles

Sheila walked to Dawn's house and back again. Circle the amount of   0498
miles Sheila walked.

    a. 6½ miles
    b. 15 miles
    *c. 13 miles

The school bus driver started from the school and went to Sheila's   0499
house, Ed's house, John's house, Dawn's house, and Mary's house;
then he went back to school. Circle the number of miles the driver
traveled.

    a. 15½ miles
    *b. 27½ miles
    c. 30 miles
    d. 25 miles

John walked to the lake, took a boat across, and then walked to   0500
Mary's house. Mary's mother drove John home. Circle the number
of miles John traveled.

    a. 20½ miles
    *b. 22 miles
    c. 9½ miles

_____ travels the longest distance to get to school. Circle   0501
the right answer.

    a. John
    b. Ed
    *c. Dawn
    d. Mary

If Sheila could go the shortest way to the post office she would   0502
travel _____ miles. Circle the correct answer.

    a. 19 miles
    b. 20 miles
  *c. 18 miles

How many miles does John travel to school than Sheila? Circle the   0503
correct answer.

    a. 8 miles
  *b. 5 miles
    c. 2 miles

How many miles less does John walk when he goes to Ed's house, than   0504
Mary walks when she goes to Dawn's house? Circle the correct answer.

  *a. 9 miles
    b. 7 miles
    c. 11 miles

The differemce in miles between the school and the lake, and the   0505
lake and Ed's house is _____ miles.

    a. 10 miles
  *b. $4\frac{1}{2}$ miles
    c. 8 miles

How many miles less does Mary have to walk to get to the post   0506
office than Dawn does? Circle the right answer.

    a. 10 miles
    b. 5 miles
  *c. 3 miles

SIZE

GIVEN A SET OF THREE BLOCKS, NO TWO OF WHICH ARE THE SAME SIZE,   0044
THE CHILD WILL SHOW HIS KNOWLEDGE OF THE MEANING OF THE WORDS
"LARGEST" AND "SMALLEST" BY CHOOSING A BLOCK AT THE DIRECTION OF
THE TEACHER.

Directions: The teacher arranges and rearranges a set of three
                 blocks, no two of which are the same size.

The blocks are arranged so that the largest block is first,   0507
smallest block is second, medium block third. The teacher says,
"Point to the smallest block."

    *a.   child points to second block
     b.   child points to first block
     c.   child points to third block

Teacher arranges blocks: smallest block first, medium block second,   0508
largest block third. "Point to the largest block."

     a.   child points to first block
     b.   child points to second block
    *c.   child points to third block

Teacher arranges blocks: medium first, smallest second, largest   0509
third. "Point to the smallest block."

     a.   child points to first block
    *b.   child points to second block
     c.   child points to third block

Blocks are arranged: medium first, smallest second, largest third.   0510
"Point to the largest block."

     a.   child points to first block
     b.   child points to second block
    *c.   child points to third block

LIQUID

THE STUDENT DEMONSTRATES AN UNDERSTANDING OF LIQUID MEASURE BY   0008
IDENTIFYING THE RELATION BETWEEN CUP, PINT, QUART AND GALLON AS
UNITS OF LIQUID MEASURE.

m

1 quart (measures the same amount as)   0511

    a. 3 pints
  *b. 4 cups
    c. 1 gallon

m

2 pints (measures the same amount as)   0512

    a. 3 cups
    b. 1 gallon
  *c. 1 quart

m

1 gallon (measures the same amount as)   0513

  *a. 4 quarts
    b. 10 cups
    c. 6 pints

Tom and Ann drink milk at three meals every day. They need 6 cups   0514
of milk. This (measures the same amount as)

    a. 1 quart and 1 cup
    b. 2 quarts
  *c. 1 quart and 1 pint

Tom's family likes ice cream. One day they bought 2 quarts of   0515
vanilla, 2 pints of strawberry and 2 pints of chocolate. This
(measures the same amount as)

    a. 6 pints
  *b. 1 gallon
    c. 5 quarts

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TIME

THE STUDENT SHOWS COMPREHENSION OF TIME BY IDENTIFYING THE RELATION   0007
BETWEEN DAY, WEEK, MONTH AND YEAR AS UNITS OF MEASURE OF TIME.

Mark the one that is <u>not</u> right.   0516

    a. There are seven days in a week.
    b. Friday comes before Saturday.
  *c. January is a week.
    d. Monday comes after Sunday.

Mark the one that is <u>not</u> right.   0517

    a. There are 12 months in a year.
    b. Some months have 30 days.
    c. Some months have 31 days.
  *d. December is the first month of the year.

BILLS AND COINS

THE STUDENT DEMONSTRATES AN UNDERSTANDING OF THE U. S. MONETARY   0006
SYSTEM BY IDENTIFYING THE RELATION BETWEEN THE PENNY, NICKEL,
QUARTER AND HALF DOLLAR AS UNITS OF MEASURE OF VALUE.

Which set of coins has the same value as 25¢?   0518

    a. 2 dimes and 5 nickels
    b. 2 dimes and 2 nickels and 5 pennies
    c. 2 nickels and 5 pennies
   *d. 1 dime and 2 nickels and 5 pennies

Which set of coins has the same value as 50¢?   0519

    a. 5 nickels
   *b. 5 dimes
    c. 1 quarter and 1 nickel and 5 pennies
    d. 1 quarter and 1 dime and 5 pennies

Which set of coins has the same value as 78¢?   0520

    a. 1 half-dollar and 1 dime and 3 pennies
    b. 2 quarters and 8 pennies
   *c. 1 half-dollar and 1 quarter and 3 pennies
    d. 7 dimes and 8 nickels

Some candy costs 17¢. You pay 25¢. What change will you get?   0521

   *a. 3 pennies and 1 nickel
    b. 7 pennies
    c. 2 nickels
    d. 3 pennies and 1 dime

A book costs 29¢. You pay 50¢. What change will you get?   0522

    a. 5 nickels
    b. 1 penny and 3 nickels
    c. 2 dimes
   *d. 1 penny and 2 dimes

GEOMETRY

SHAPES

THE CHILD WILL APPLY HIS KNOWLEDGE OF SHAPES BY NAMING COMMON   0039
TWO-DIMENSIONAL SHAPES WHEN PRESENTED WITH OBJECTS IN THE ROOM.

Child is presented with a clock.   0523

Child says,

   a. "square"
   b. "rectangle"
 *c. "circle"
   d. no response

Child is presented with a square desk.   0524

Child says,

   a. "rectangle"
 *b. "square"
   c. "circle"
   d. no response

Child is presented with a rectangle chalkboard   0525

Child says,

 *a. "rectangle"
   b. "square"
   c. "circle"
   d. no response

Child is presented with a piano key.   0526

Child says,

 *a. "rectangle"
   b. "square"
   c. "circle"
   d. no response

GIVEN A CHALKBOARD ON WHICH ARE DRAWN A CIRCLE, A TRIANGLE, A   0041
SQUARE, AND A RECTANGLE, THE CHILD SHOWS THAT HE KNOWS THE NAMES
OF THE SHAPES BY CIRCLING THE SHAPE WHOSE NAME IS SPOKEN BY THE
TEACHER.

Teacher says "triangle".   0527

    a. child circles circle
  *b. child circles triangle
    c. child circles square
    d. child circles rectangle
    e. no response

Teacher says "rectangle".   0528

    a. child circles circle
    b. child circles triangle
    c. child circles square
  *d. child circles rectangle
    e. no response

Teacher says "circle".   0529

  *a. child circles circle
    b. child circles triangle
    c. child circles square
    d. child circles rectangle
    e. no response

Teacher says "square".   0530

    a. child circles circle
    b. child circles triangle
  *c. child circles square
    d. child circles rectangle
    e. no response

THE CHILD WILL SHOW HIS KNOWLEDGE OF SHAPES BY NAMING THE SHAPE   0042
WHICH THE TEACHER MAKES WITH A LENGTH OF ROPE ON THE FLOOR.

Teacher makes a triangle   0531

    a.   child says "circle"
    b.   child says "square"
*c.   child says "triangle"
 . d.   child says "rectangle"
    e.   child says "ellipse"
    f.   no response

Teacher makes a circle   0532

*a.   child says "circle"
    b.   child says "square"
    c.   child says "triangle"
    d.   child says "rectangle"
    e.   child says "ellipse"
    f.   no response

Teacher makes a square   0533

    a.   child says "circle"
*b.   child says "square"
    c.   child says "triangle"
    d.   child says "rectangle"
    e.   child says "ellipse"
    f.   no response

THE CHILD WILL APPLY HIS KNOWLEDGE OF SHAPES — SQUARE, CIRCLE,   0049
TRIANGLE, RECTANGLE, BY RECOGNIZING AND NAMING A SHAPE FROM AN
ARRANGEMENT OF OBJECTS MADE BY THE TEACHER.

Directions: Teacher assembles pencils, rods, string, with which
                 to form shapes on the floor.

Teacher makes a rectangle with pencils.   0534

    a. child says square
    b. child says circle
    c. child says triangle
 *d. child says rectangle

Teacher shapes a length of string into a circle.   0535

 *a. child says circle
    b. child says square
    c. child says triangle
    d. child says rectangle

Teacher uses rods to make a square.   0536

    a. child says circle
 *b. child says square
    c. child says triangle
    d. child says rectangle

Teacher uses 3 pencils to make a triangle.   0537

    a. child says circle
    b. child says square
 *c. child says triangle
    d. child says rectangle

Teacher makes a long rectangle with rods and pencils.   0538

    a. child says circle
    b. child says square
    c. child says triangle
 *d. child says rectangle

SYMMETRY

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GIVEN AN UNCOMPLETED SHAPE OR OBJECT, THE CHILD WILL SHOW HIS   0057
ABILITY TO ANALYZE THE THREE CHOICES GIVEN HIM ACCORDING TO THE
CRITERION OF SYMMETRY BY SELECTING THE HALF WHICH COMPLETES THE
WHOLE SYMMETRICALLY.

Directions: The child receives half a shape from the teacher.
                On the chalk board, the teacher draws two halves
                opposite and similar to the one the child holds
                and one opposite and exactly the same as the child's.
                The child then holds his half next to the half on
                the chalk board which completes the whole symmetri-
                cally.

The teacher gives the child: Q   0539

    a. Child matches it with   D
    *b. Child matches it with   ∅
    c. Child matches it with   ◊

The teacher gives the child: ◁   0540

    a. Child matches it with   ▷
    b. Child matches it with   ▽
    *c. Child matches it with   D

The teacher gives the child: ◁   0541

    a. Child matches it with   q
    *b. Child matches it with   ▷
    c. Child matches it with   P

The teacher gives the child: ◁   0542

    *a. Child matches it with   ▷
    b. Child matches it with   ▲
    c. Child matches it with   D

The teacher gives the child: ℛ   0543

    a. Child matches it with   ℛ
    *b. Child matches it with   ℛ
    c. Child matches it with   ℬ   160

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PATTERNS

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GIVEN AN UNCOMPLETED SEQUENCE OF GEOMETRIC FIGURES, THE CHILD   0064
WILL SHOW HIS ABILITY TO ANALYZE THE PATTERN BY CHOOSING THE
GEOMETRIC FIGURE WHICH COMES NEXT.

□ ○ △ □ ○ △   0544

*a. child chooses □
 b. child chooses ○
 c. child chooses △
 d. no response

○ ○ ○ ○ ○ ○   0545

 a. child chooses ○
 b. child chooses ○
*c. child chooses ○
 d. no response

□ ▭ ○ □ ▭ ○   0546

 a. child chooses ○
*b. child chooses □
 c. child chooses ▭
 d. no response

□ □ ▫ □ ◻ ▪ □   0547

 a. child chooses □
*b. child chooses □
 c. child chooses ▪
 d. no response

△ ○ □ △ ○ □ △ ○   0548

*a. child chooses □
 b. child chooses △
 c. child chooses ○
 d. no response

SETS

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EMPTY

GIVEN A CHALKBOARD ON WHICH THE TEACHER WILL DRAW SETS OF OBJECTS,   0043
THE CHILD WILL SHOW HIS KNOWLEDGE OF THE MEANING OF THE TERM
"EMPTY SET" BY POINTING TO THE EMPTY SET ON THE BOARD.
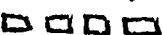
Teacher draws the following three sets: 0549

   a. child points to [△△△△△   ]
 *b. child points to [   ]
  c. child points to [○○○○   ]

Teacher draws three sets: 0550

 *a. child points to [   ]
  b. child points to [★★★★★   ]
  c. child points to [▭▭▭▭   ]
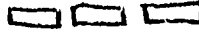
Teacher draws three new sets: 0551

  a. child points to [♀]
 *b. child points to [   ]
  c. child points to [○○○○○○   ]

Teacher makes three new sets: 0552

  a. child points to [▭▭▭   ]
  b. child points to [▽▽▽▽▽▽   ]
 *c. child points to [   ]

ONE

THE CHILD WILL DEMONSTRATE HIS KNOWLEDGE OF THE MEANING OF "A SET   0063
OF ONE" BY IDENTIFYING A SET OF ONE WHEN THE TEACHER MAKES THREE
SETS ON THE CHALKBOARD, ONE BEING A SET OF ONE.

Teacher makes a set of 2, 1, 4 objects.   0553

   a. child circles a set of two
 *b. child circles a set of one
  c. child circles a set of four
  d. no response

Teacher makes a set of 1, 3, 5 objects.   0554

 *a. child circles a set of one
  b. child circles a set of three
  c. child circles a set of five
  d. no response

Teacher makes a set of 4, 2, 1 objects.   0555

  a. child circles a set of four.
  b. child circles a set of two
 *c. child circles a set of one
  d. no response

Teacher makes a set of 6, 1, 4 objects.   0556

  a. child circles a set of six
 *b. child circles a set of one
  c. child circles a set of four
  d. no response

EQUAL—EQUIVALENT

GIVEN A FLANNELBOARD ON WHICH ARE SETS OF OBJECTS 1 THRU 5, THE   0045
CHILD WILL SHOW HIS KNOWLEDGE OF THE MEANING OF EQUIVALENT SETS
BY POINTING TO A SET ON THE FLANNELBOARD WHICH IS EQUIVALENT TO
THE SET THE TEACHER HOLDS UP ON A CARD.

Teacher holds up a set of three   0557

    a.   child points to set of one
    b.   child points to set of two
  *c.   child points to set of three
    d.   child points to set of four
    e.   child points to set of five

Teacher holds up a set of one.   0558

  *a.   child points to set of one
    b.   child points to set of two
    c.   child points to set of three
    d.   child points to set of four
    e.   child points to set of five

Teacher holds up a set of four   0559

    a.   child points to set of one
    b.   child points to set of two
    c.   child points to set of three
  *d.   child points to set of four
    e.   child points to set of five

Teacher holds up a set of two   0560

    a.   child points to set of one.
  *b.   child points to set of two
    c.   child points to set of three
    d.   child points to set of four
    e.   child points to set of five

Teacher holds up a set of five   0561

    a. child points to set of one
    b. child points to set of two
    c. child points to set of three
    d. child points to set of four
  *e. child points to set of five

GIVEN A FLANNELBOARD ON WHICH ARE SETS OF OBJECTS, SIX THRU TEN,   0046
THE CHILD WILL DEMONSTRATE HIS KNOWLEDGE OF THE MEANING OF
"EQUIVALENT SETS" BY POINTING TO A SET ON THE FLANNELBOARD WHICH
IS EQUIVALENT TO THE SET THE TEACHER HOLDS UP ON A CARD.

Teacher holds up a set of seven   0562

    a. child points to set of six
  *b. child points to set of seven
    c. child points to set of eight
    d. child points to set of nine
    e. child points to set of ten

Teacher holds up a set of eight   0563

    a. child points to set of six
    b. child points to set of seven
  *c. child points to set of eight
    d. child points to set of nine
    e. child points to set of ten

Teacher holds up set of ten   0564

    a. child points to set of six
    b. child points to set of seven
    c. child points to set of eight
    d. child points to set of nine
  *e. child points to set of ten

Teacher holds up set of six   0565

   *a.   child points to set of six
    b.   child points to set of seven
    c.   child points to set of eight
    d.   child points to set of nine
    e.   child points to set of ten

Teacher holds up set of nine   0566

    a.   child points to set of six
    b.   child points to set of seven
    c.   child points to set of eight
   *d.   child points to set of nine
    e.   child points to set of ten

GIVEN A SHEET DISPLAYING SEVERAL OBJECTS, THE CHILD WILL SHOW HIS   0065
KNOWLEDGE OF THE MEANING OF "EQUIVALENT SET" BY CHOOSING A SET
THAT IS EQUIVALENT TO THE GIVEN SET.

Teacher shows a set of 3 boys   0567

    a.   child chooses two balls
   *b.   child chooses three balls
    c.   child chooses four balls
    d.   no response

Teacher shows a set of 5 cups   0568

   *a.   child chooses five saucers
    b.   child chooses six saucers
    c.   child chooses three saucers
    d.   no response

Teacher shows a set of 4 ice cream cones   0569

    a.   child chooses seven dips of ice cream
    b.   child chooses six dips of ice cream
   *c.   child chooses four dips of ice cream
    d.   no response

Teacher shows seven black cats   0570

    a. child chooses ten jack-o-lanterns
    b. child chooses five jack-o-lanterns
  *c. child chooses seven jack-o-lanterns
    d. no response

Teacher shows two girls   0571

    a. child chooses six lollipops
  *b. child chooses two lollipops
    c. child chooses three lollipops
    d. no response

Teacher shows six hearts   0572

    a. child chooses four arrows
    b. child chooses five arrows
  *c. child chooses six arrows
    d. no response

Teacher shows nine seals   0573

  *a. child chooses nine balls
    b. child chooses seven balls
    c. child chooses four balls
    d. no response

Teacher shows eight clowns   0574

    a. child chooses ten hats
    b. child chooses five hats
  *c. child chooses eight hats
    d. no response

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